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1954

Interview with T. Claude Ryan, President, Ryan Aeronautical Corp..22

Senate Report Hits Offshore Buying ...13

★

Britain Waits for Answer on Comet ..17

★

Talbott: Off the Cuff And Off the Track ..19

★

Industry Hostile to ACC Aviation Report 31

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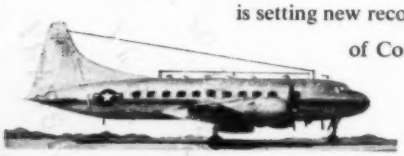

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Highest fighter designation for the U. S. Air Force remains Republic's F-105, last in the series of "100-series" supersonic fighters to get a firm number, although numbers through the F-109 are projected for four still-secret planes. Latter group probably includes the Bell and Ryan vertical-take-off fighters.

In the bomber category, Douglas B-66 is highest designation while Boeing's C-137 (turboprop version of the C-97) is the latest transport to be officially designated.

Highest numbered jet engine is General Electric's J79, powerplant for the Convair XB-58 supersonic bomber. GE also has the highest-numbered turboprop engine, the T58 shaft turbine for use in helicopter applications.

•

Load factors remain the biggest question mark in the airlines' future economic picture. A one percent drop in passenger load factors for the domestic trunk airlines cuts their revenues by $12 million. Load factor was down to 64.7% in 1953 contrasted with 69.6% in 1951 and 67.1% in '52.

Problem is not purely equipment, more specifically, is not necessarily overequipping by carriers. Answer lies in complex relationship of equipment, routes, schedules, peak period requirements and pure political pressure.

•

Boeing's 707 jet transport tanker is now scheduled to fly early in July. Collapse of left landing gear during taxi tests, which delayed initial flight, highlighted interesting aspect of pod-type engine installation: Pods absorbed much of impact minimizing outer wing damage.

First flight of the 707 would have been a fact except for weather. Flights were scheduled twice prior to the gear incident only to be cancelled by bad weather.

•

Impetus given flying boat development by jet and turboprop engines is highlighted by Convair decision to build a west coast towing basin at San Diego. West coast manufacturers have been forced to use NACA's Langley Field hydrodynamic facility in the past.

Convair's own jet powered F2Y-1 Sea Dart, which uses hydro skis for takeoff and landing, and the turboprop powered R3Y transport lead the water based aircraft development field.

Martin's P6M Seamaster, a four-engine jet-powered bomber for anti-submarine work, is another strong rallying point for the flying boat supporters.

Martin reportedly holds some hope of getting back into commercial transport activities with a civil version of the Seamaster. By turboprop standards the Convair R3Y is an advanced design competitive with land based planes and might also have commercial prospects.

Bendix - 12/13/55

The Washington View

Move for McNeil?

Assistant Defense Secretary Wilfred J. McNeil had hardly left the country, accompanying Defense Secretary Charles Wilson on his current Far East tour, when there were reports that he was on his way out as Comptroller. Behind the scenes, it now turns out, there has been a minority group of Pentagon brass pushing McNeil's name for the vacant post of U. S. Comptroller General.

However, it would probably be a big disappointment in the end to his "unsolicited" sponsors even if McNeil should ultimately get the top GAO job. Moreover, competition for the $17,500 post (15-year term) has become fierce. Two leading candidates are considered to be Rep. W. Sterling Cole (R.-N.Y.), Chairman of the Joint Atomic Energy Committee, and Mark Trice, Secretary of the Senate.

Cease and Desist - - Later

When CAB was deadlocked last week on the eight-hour flight rule waiver request of American Airlines and unable to contact fifth-member Harmar Denny in Rome, CAA Administrator Fred B. Lee gave the Board an able assist. Lee, though supporting AA's bid for waiver of the rule for westbound DC-7 nonstops, was bound to enforce the rule and had set a deadline for compliance by AA.

Without Denny, CAB couldn't decide the waiver before deadline. So at deadline time, Lee simply filed a petition with CAB for a cease and desist order against American. Since the waiver petition had priority, CAB wasn't required to rule on Lee's order until it decided the waiver question. And AA didn't have to change its schedules.

Suppression and Inconsistency

National Aviation Trades Association is still conducting its running fight with the Air Force over the merits of civil contract technical schools versus service training. "As a last resort, because the Air Force has determined a fixed policy not to use civil aviation mechanic schools," NATA went to Congress.

Charles Parker, NATA executive director, charged such a policy is "inconsistent" in testimony before a Senate Appropriations subcommittee, chairmanned by Sen. Homer Ferguson (R.-Mich.). Parker said "the Air Force has praised the economy and efficiency obtained from nine civil contract flight schools and yet has refused to use our mechanic schools."

He also accused the Air Force of suppressing its cost figures for training aircraft and engine mechanics to prevent a comparison with NATA cost figures. It was further challenged that the Air Force cost statements that have been released "are open to serious question." Parker said he visualized "enormous economies" being lost through the military's failure to utilize more civilian schools.

'Finally and Flatly Rejected'

The Administration, after a prolonged delay, has finally and flatly rejected Sen. Pat McCarran's proposed rewrite of the 1938 Civil Aeronautics Act, which the Senate Commerce Committee has labored with for the past two months. As an alternative, it was recommended that the Act be specifically amended to implement the new civil air policy report of the Air Coordinating Committee.

However, ACC Chairman Robert B. Murray declared, "much of the proposed policy program can be carried out within the framework of existing statutory authority." With Murray and CAB Member Oswald Ryan calling the major inside policy shots, CAB is losing its identity as an "arm" of Congress and beginning to more and more resemble an "arm" of the Commerce Department.

Intercontinental Guided Missiles

President Eisenhower's signing into law new legislation authorizing a $5,000,000 expansion in the research facilities of the National Advisory Committee for Aeronautics provides, among other things, for additional studies into fuel for intercontinental guided missiles and development of high-speed seaplane fighters.

Allocation is as follows:

- **Hampton, Va.**, $1,200,000 for a new hydrodynamic facility.
- **Moffett Field, Calif.**, $349,000 for alterations to two supersonic wind tunnels.
- **Lewis Laboratory, Cleveland**, $3,431,000 for a rocket engine research facility.

Controversial Report Due

Commerce Department officials now say they expect to receive a final report by June 10 on an outside CAA engineering-management survey. The report is due from the Pittsburgh firm of Cresap, McCormick, and Padget, which undertook the CAA study last year on contract for $104,000.

The survey has been under heavy fire from Sen. Pat McCarran (D.-Nev.). Periodically at odds with the Administration over CAA matters, Senator McCarran branded the private study as "a complete waste of money." He has repeatedly demanded that Commerce Under Secretary Robert B. Murray account for the survey's being made.

. . . Preble Staver

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June 7, 1954 **Vol. 18, No. 1**

Letters	6	West Coast Talk	42
Books	6	Photo Credits	42
Editorial	9	Maintenance Bulletin Board	44
Industry Spotlight	10	New Products	47
Senate Hits Offshore Buying	13	Manufacturing Salaries	52
AIA Hears Atom Plane Prospects	14	Extra Section	53
Britain Waits for Comet Answer	17	Biggest Skin Milling Machine	54
News Briefs	18	People	56
Military Commentary	19	CAB News	60
DC-7B May Fly Ocean Nonstop	20	Airline Commentary	62
Interview with T. Claude Ryan	22	International Aviation	65
DC-3 Conversion Marks PAC Meeting	28	Bulletin Board (classified advts.)	66
ACC Report on Aviation Released	31	Advertisers Index	67
Four-Way Radar Developed	39	En Route	68
Airport Operators Reject CAB Plan	40		

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OTHER PUBLICATIONS . . .

American Aviation Daily, a daily news service for the entire industry. $200 per year. Managing Editor: Keith Saunders.

American Aviation Directory: twice yearly listing of products, people and organizations. $7.50 each. Managing Editor: Marion E. Gramlow.

Official Airline Guide: Monthly publication of airline schedules and fares. $13.50 per year in USA; $14.00 in Canada; $15 elsewhere. Published from 139 N. Clark St., Chicago 2, Ill. Central 6-5804. Managing Editor: Robert Parrish.

Air Traffic News (incorporating Air Tariff Reports): Daily rates and tariff news. $175 per year. Managing Editor: Wallace I. Longstreth.

Air Information Division: 595 Broad Avenue, Ridgefield, N. J. Phone: Morsemere 6-8850. Edward H. Henkler, director.

When & Where

June 7-9—AFL-Machinists, 3d Aircraft & Guided Missiles Conference, Atlanta, Ga.

June 7-10—Society of Plastics Industry, 6th Nat'l Exposition, Cleveland, O.

June 8-9—ATA universal air travel plan mtg., Drake Hotel, Chicago.

June 8-12—Aviation Writers Assn. annual convention, Roney-Plaza Hotel, Miami Beach.

June 9-11—Airline Operations Conference committee mtg., Williamsburg Inn, Williamsburg, Va.

June 9-11—American Society for Quality Control, 8th Annual Convention, Jefferson Hotel, St. Louis.

June 17—ATA Board of directors mtg., New York City.

June 20-23—Aviation Distributors & Manufacturers Assn., mid-year mtg., Stanley Hotel, Estes Park, Colo.

June 21-24—Inst. of the Aeronautical Sciences, summer mtg., Los Angeles.

June 22-23—ATA reservations committee mtg., Park Plaza Hotel, St. Louis.

June 24-26—American Helicopter Society 10th annual forum, Mayflower Hotel, Washington, D. C.

June 29-July 2—University Aviation Assn., summer mtg., Hotel Fontenelle, Omaha, Neb.

July 13-15—National Assn. of State Aviation Officials, board of directors meeting, Nantucket Island, Mass.

Aug. 9-11—Turbine Powered Air Transportation mtg., Seattle, Wash. (sponsored by IAS).

June 22-24—Joint mtg. of ATA and AIA committees on turbine-powered transport regulations, Los Angeles.

Aug. 19-22—Air Force Assn., 8th annual convention, Omaha, Neb.

Sept. 4-6—National Aircraft Show, Dayton, Ohio.

Sept. 13-24—Instrument Society of America, First Int'l Instrument Congress & Exposition, and 9th Nat'l Instrument Conference & Exhibit, Philadelphia.

Sept. 22-25—Nat'l Assn. of State Aviation Officials, annual mtg., New Washington Hotel, Seattle.

Oct. 3-5—Champion Spark Plug, 10th annual mtg., Hotel Secor, Toledo, Ohio.

INTERNATIONAL

June 15—ICAO Meteorological Division, 4th session, Montreal.

June 18-19—British National Air Races, Baginton Airport, Coventry, Britain.

Sept. 7-12—Society of British Aircraft Constructors, Aircraft Show & Flying Display, Farnborough, England.

Sept. 13-17—IATA, 10th annual mtg., Paris.

Sept. 20-29—Federation Aeronautique Internationale general meeting, Istanbul, Turkey.

Sept. 21—IATA, Traffic Conferences, Italy.

Oct. 5—ICAO, air navigation mtg. for the North Atlantic region, Montreal.

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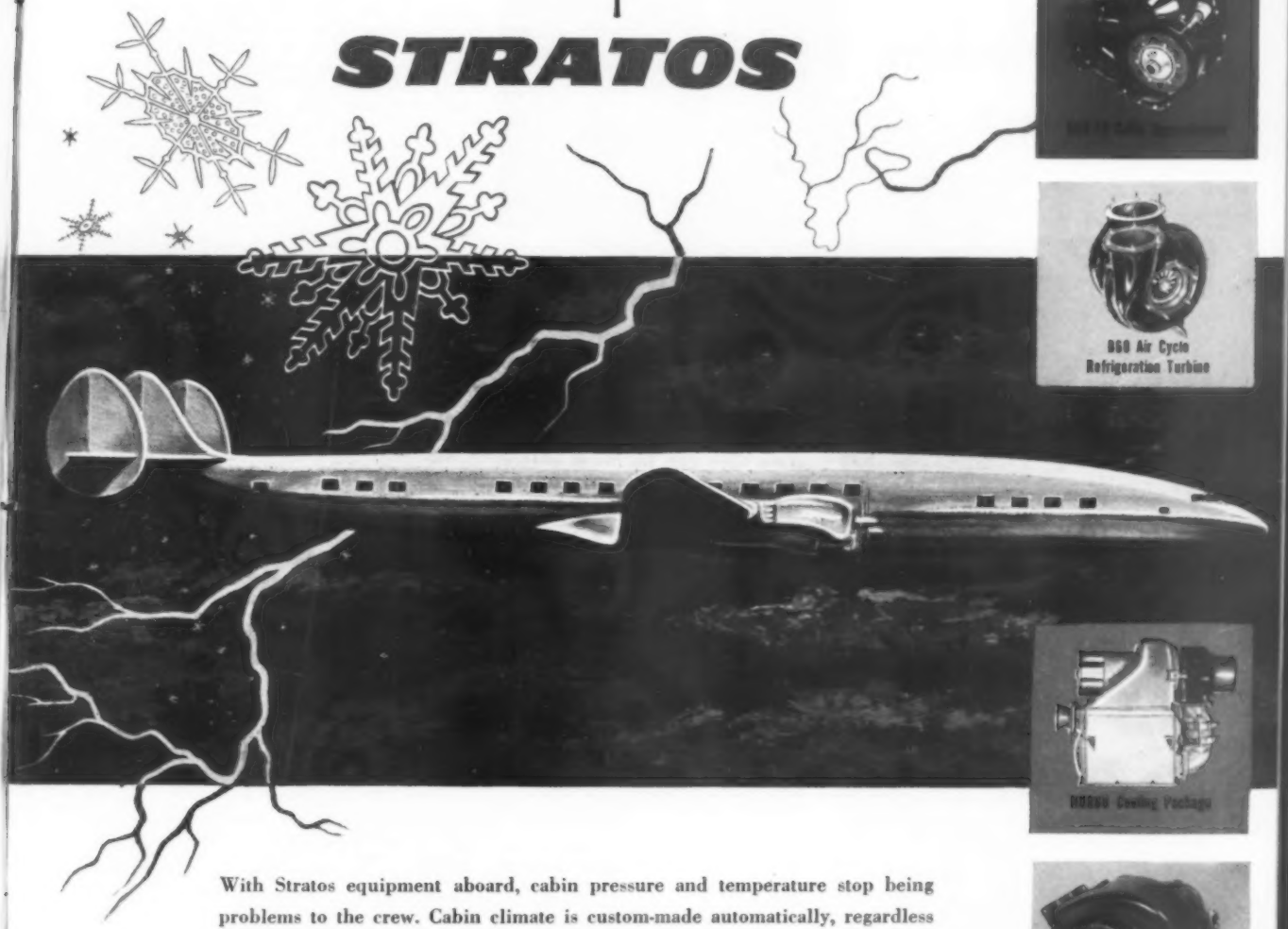

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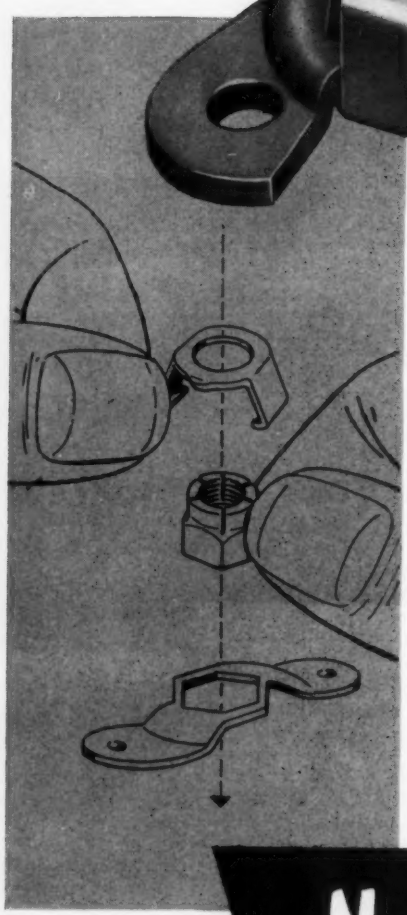

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CONGRATULATIONS

To the Editor:

Your article relative to business flying in the April 26th issue of AMERICAN AVIATION has come to our attention. You are to be congratulated on this nice piece of writing and upon the very informative and complete coverage that you have given those in the business aircraft manufacturing and service industry.

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EXCELLENT COVERAGE

To the Editor:

May I compliment you on the excellent coverage of the aviation field you are presenting in AMERICAN AVIATION.

LOUIS W. STROBEL
Research Engineer

North American Aviation, Inc.
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Books

PILOT, *by A. W. (Tony) LeVier, as told to John Guenther. Published by Harper and Bros., N. Y. 263 pp., illustrated. Price: $3.50.*

Today virtually everyone in aviation, and many outside aviation, recognize "Tony" LeVier as one of the country's top pilots. As an engineering test pilot with Lockheed Aircraft Corp. since May, 1941, he has been a focal point in the testing of many of Lockheed's famous aircraft, from the Hudson bomber through the P-38 and T-33 to the supersonic F-94C.

This is a moving account of how LeVier, a kid too sickly to stay in school, became interested in flying, the men who inspired him and made it financially possible for him to fly, his experiences as a fledgling pilot, barnstormer, racing pilot, airline pilot, and finally as ferry, production, and engineering test pilot for Lockheed.

"Pilot" is more than the story of a pilot, it is an interesting account of the industry's growth from a rich man's sport to the backbone of the world's military defense.

. . . WDP

XB-62

SECRET

SNARK XB-62, new pilotless bomber of the U. S. Air Force, is the culmination of more than seven years of development by Northrop Aircraft, Inc., pioneer company in the field of guided missiles. It is a deadly team-mate for the long-range Northrop Scorpion F-89 all-weather interceptor which now stands guard in great numbers along our borders, and in the far north astride the polar air routes to America's heartland. Like the F-89, the secret SNARK is another spectacular product built by the precision team of Northrop men and machines. Each day, the output of other Northrop products, such as target planes, optical range finders and ordnance equipment, adds still greater strength to the defense of our nation.

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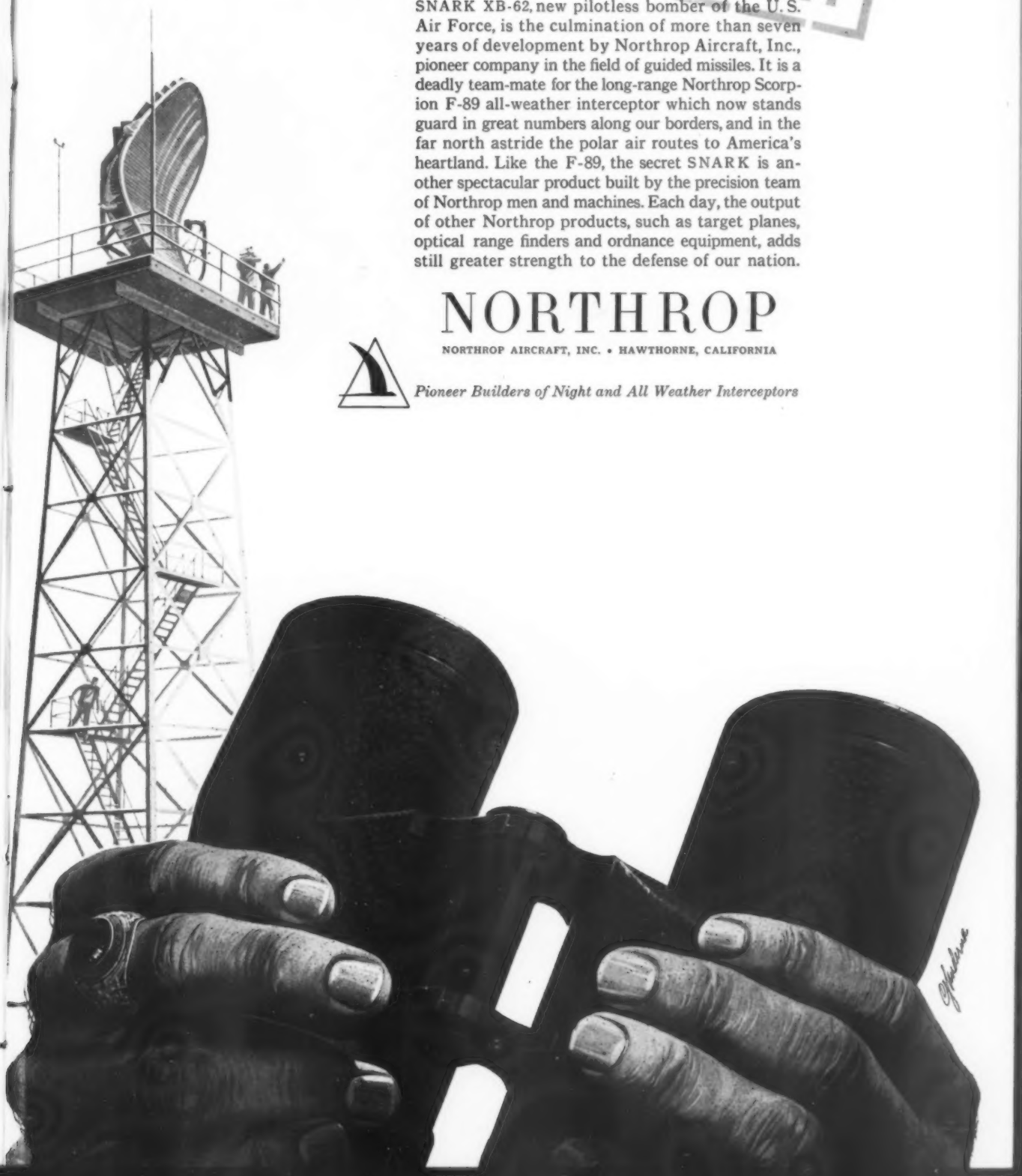

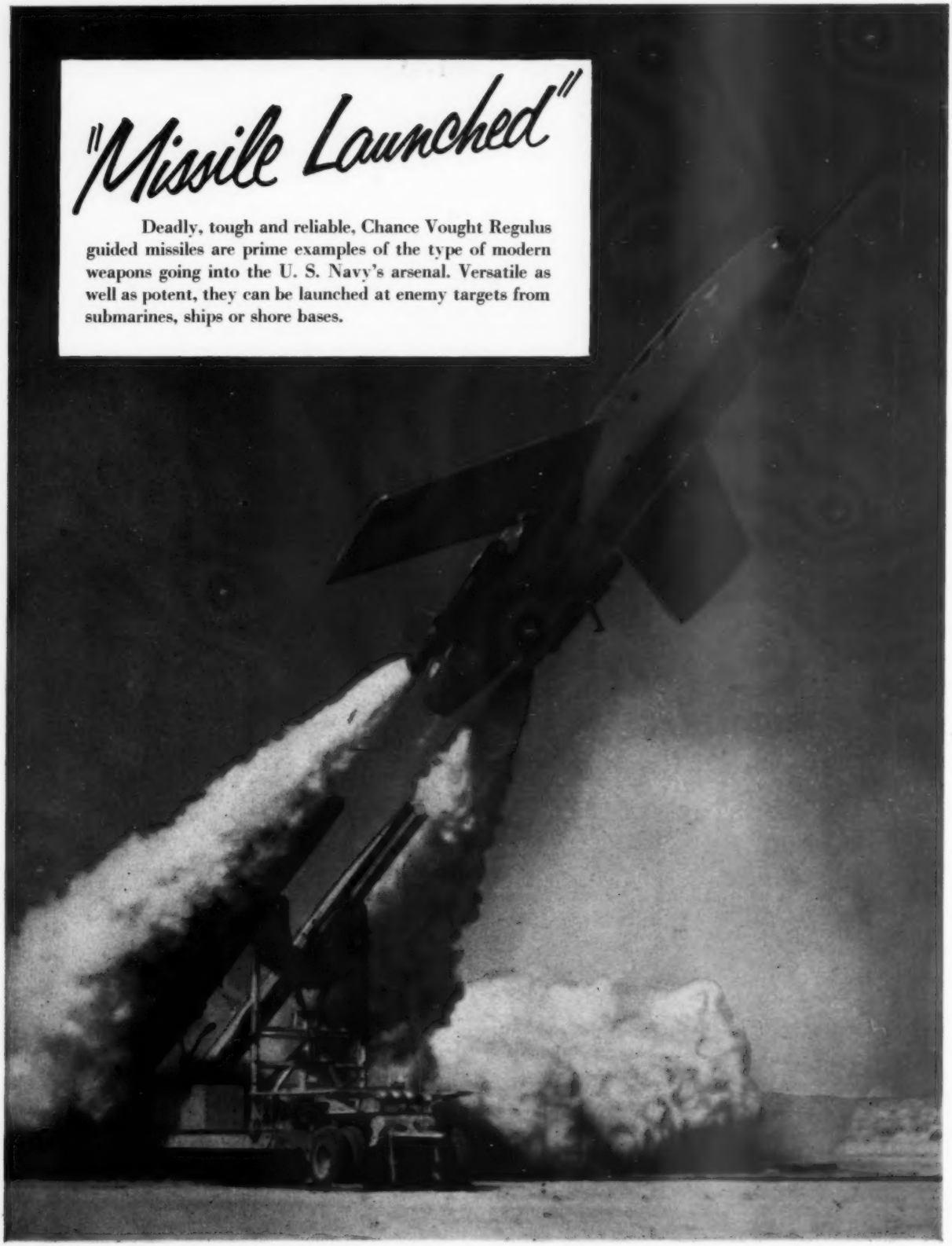

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EDITORIAL

None Too Soon

REDUCED EARNINGS for the airline industry for the first quarter of this year made it unmistakably clear that the industry must seek increased revenues if it is to avoid financial trouble before the year is out. None too soon, the Air Transport Association presented a clear-cut economic report to the Civil Aeronautics Board on May 18 asking for authority by the trunk carriers to discuss ways and means of overcoming the higher cost trend and a levelling off of traffic.

by
W. W. P.

Inevitably the result will be higher fares in one form or another. Capital commitments by the industry are staggering considering its size. Traffic continues to increase but more and more is carried at lower coach fares. The major penetration of rail traffic has already been taken and the airlines' major competitor, the private automobile, is beyond immediate reach. Load factors have been going down with the addition of much new equipment.

ATA's presentation was thorough and sound. The CAB should not wait long to act, else the industry might face the kind of crisis into which it was plunged in 1947. The time for relief is now.

Viscount Influence

There is no doubt whatever that the turboprop Vickers Viscount transport is having a considerable influence on design thinking among American airline operators. Not only will Trans-Canada Air Lines be flying the Viscount on this continent, but it will be operating the airplane into one or more U. S. terminals. And the visit of Capital Airlines officials to the Vickers factory in England has stirred up all manner of conjecture about the prospects of Vickers breaking into the U. S. market.

Adding considerably to the discussions was the speech by William Littlewood, vice president of research for American Airlines, before the SAE in California early last month. One of the most astute and far-seeing engineers in the country, Littlewood acknowledged that the next air transport development might well be a four-engined turboprop type and somewhat larger in capacity than the existing twin-engine types. Although not mentioning the Viscount by name, Littlewood was obviously referring to it as bringing a new competitive element into the American scene.

Convair, especially, is not taking the Viscount inroad sitting down, and is willing and anxious to take on all comers when it comes to comparing costs and speeds. Convair certainly doesn't have to apologize for the excellent records being made everywhere with the 340. Although Convair and Vickers are battling for the same operators' dollar in many instances, the fact is that the two airplanes are in somewhat different categories. The Convair's hold on the short-haul market is solid, while the Viscount's appeal is in the longer intermediate-haul field. The twin-engine transport will be with us always, at least as far as anyone can see. But the Viscount is bound to stimulate a lot of thinking either on its own account or in opening a new field for our own manufacturers. The latter are dependent, of course, upon turboprop powerplants, in which the U. S. has been amazingly negligent.

Emphasis on Quality

In several speeches recently the Assistant Secretary of the Air Force (Materiel), Roger Lewis, has placed considerable stress on the shifting Air Force program from high production rates where quality was secondary in importance to output, from necessity, to an emphasis on quality.

It is probably a safe assumption that at no previous time in military aviation has more attention been given to improvement of weapons and systems than we are now seeing at the Pentagon. This is a good sign. The achievement of quality is altogether as urgent as readiness. Never before have the resources of industry—which so often have not been fully used—been given such an opportunity to go all-out in new developments and improvements. The emphasis on quality is one military program on which there can be no disagreement.

And Now Eighteen

This issue of AMERICAN AVIATION begins the eighteenth year of a publication which began in a tiny two-room office in a Washington office building and which now, with its numerous affiliated publications, has grown into the largest aviation publishing house in the world. There is no time these days for reminiscing. The onward rush of aviation continues apace as it has during these history-packed seventeen years. We are proud of the part we have had in recording and interpreting the fantastic growth of the vast commercial and military enterprise which has stemmed from the development of the airplane. "There is so much to do and so little time in which to do it."

. . . WAYNE W. PARRISH

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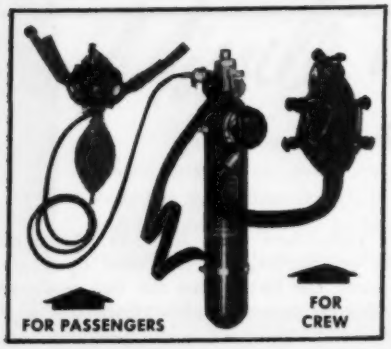

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Industry Spotlight

• Lockheed's prototype XC-130 transport, powered by four Allison T56 turboprops, should roll out of the company's Marietta, Ga., plant later this month. USAF has announced a new contract for 40 C-130's, apparently a follow-on contract boosting the initial order.

• A $600,000 development and production facility at Gainesville, Fla., Municipal Airport is planned by Sperry Corp. to house its newly announced Electronic Tube Division. Some 200-300 engineering and production personnel will staff the facility, which will initially produce SAL-39 Klystron tubes for Navy-developed air navigation systems.

• Air Cruisers Co., Belmar, N. J., has developed a new passenger evacuation chute which is self-inflating and self-supporting once inflated. Chute is now undergoing CAA tests in cooperation with the Navy. Weight of the two-ply Neoprene-coated nylon chute is under 40 pounds; inflation time is seven seconds. A specially designed Walter Kidde air injector provides inflation.

• Increased use of magnetic amplifiers to replace electronic tubes and thus improve reliability is gaining headway in aviation applications with Lear's L-2 and Collins Radio's autopilots current examples of the trend. Improved design of magnetic amplifiers is minimizing the weight penalty involved.

• Hawker Hunters, probably from production line of Fokker in Holland, will be used by USAF pilots in a program of familiarization with one of the key fighter aircraft in the North Atlantic Treaty Organization program.

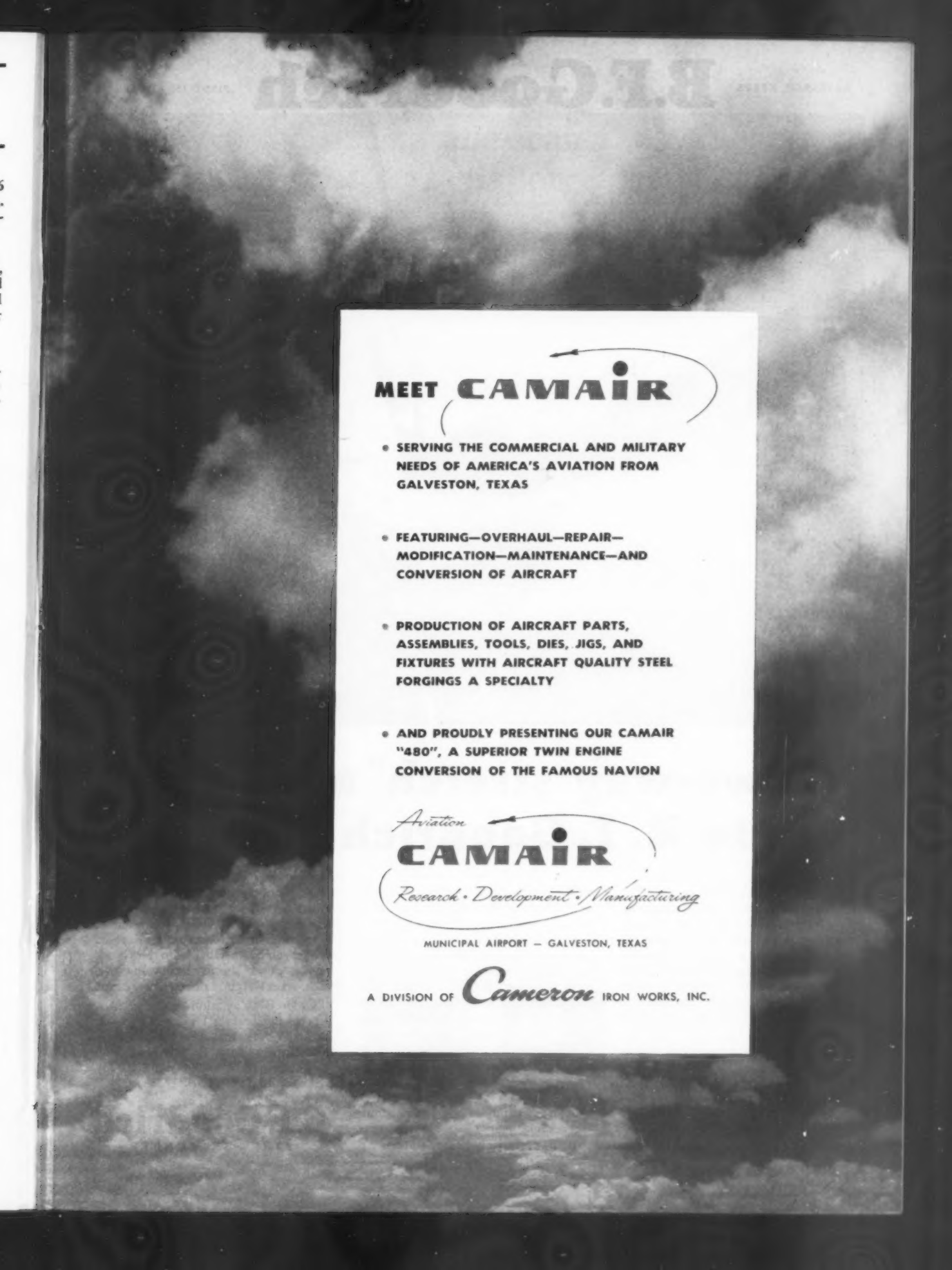
• Air Line Pilots Association, in presentation before the National Fire Protection Association, claimed that in 157 airframe fire incidents between 1949 and 1952 only 81 were reported by fire detector systems. More than 70% of airframe fire warnings in this period were false alarms, ALPA said, and engine detectors were little better, with about 25% false alarms.

• USAF activated its new Early Warning and Control Division on May 1, flying Lockheed RC-121C radar picket planes. From eight to 12 aircraft will be included in each squadron. About 40 RC-121C's will make up the first division, but only half a dozen have been delivered to the USAF so far. Planes contain 5½ tons of electronic detection, communications, and navigation equipment.

• Production deliveries on Bendix Radio's new RDR-1 airborne radar systems are expected this fall, with one of first units going to Remmert-Werner, Inc. at St. Louis. Engineering prototype will be installed in a Douglas DC-6B of Pan American's Atlantic Division for evaluation trials. A new booklet on the RDR-1 system, first shown at the Institute of Radio Engineers meeting in Dayton recently, is available from Bendix.

• Activities of Pacific Airmotive Corp. in the design and production of test and ground handling equipment has been expanded to PAC's Linden, N. J. division. Company has been producing test equipment at its Burbank, Calif. facility since 1939 and new move is aimed at east coast market presented by aircraft and engine producers.

• A new continuous-wire type of aircraft fire detector system under development by American Machine & Foundry Co. Electronics Division, Boston, Mass., operates on the principle that the electrical conductivity of the flame completes the circuit and energizes the alarm system. Design is said to be particularly adapted to high temperature areas in jet engines, where warning is needed only when flame is actually present. System is being tested on a B-36 nacelle at CAA's Indianapolis development and evaluation center.



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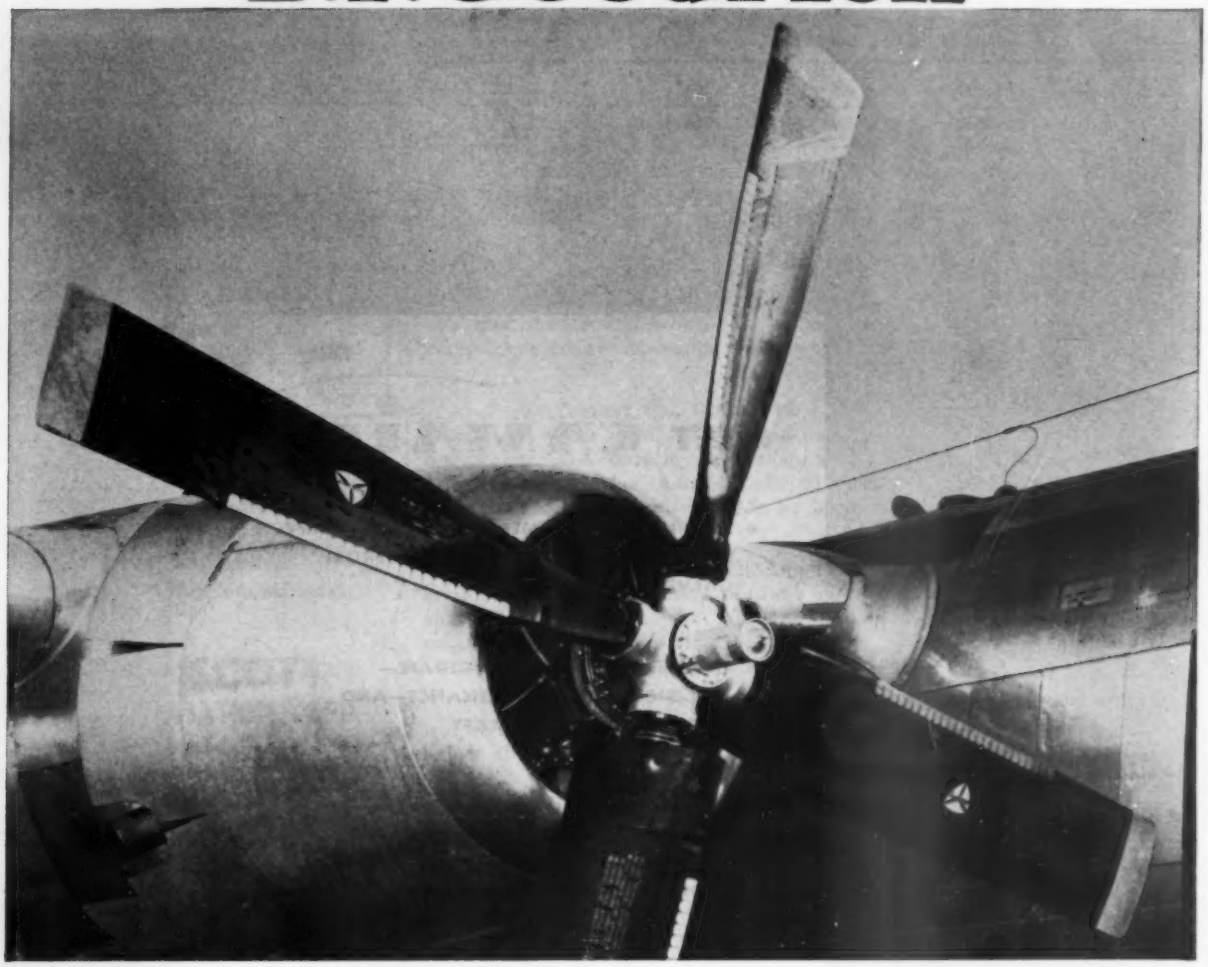
RESEARCH KEEPS **B.F.Goodrich** FIRST IN RUBBER



"Two-way stretch" adds life to B. F. Goodrich shoe

STRAIGHT electric wires in propeller shoes do a good job of supplying the heat needed to remove ice. Yet they haven't enough "give" when installing the shoe around a curved propeller blade and not enough ruggedness to take the effects of normal vibration. In either case, stresses may cause the wires to weaken and break, and the shoes have to be replaced.

B. F. Goodrich engineers set out to design a prop shoe for the Air Force's C-119 Packet that would solve these problems. First, they adopted the idea of using stranded wires . . . miniature cables that add strength without adding weight. Then, they crimped the wires into a "zig-zag" shape. This gives the shoe a built-in flexibility, lets it *stretch two ways* to prevent wire breakage.

B. F. Goodrich also designed a separate heated rubber skin for the propeller cuff, using the same zig-zag wire arrangement. The new B. F. Goodrich "two-way stretch" propeller shoe and cuff are now in service on the C-119, giving long service life and dependable ice removal.

A typical development of B. F. Goodrich engineering and research for aviation, electrically-heated rubber is also used on wings, hydraulic lines, water tanks, spinner domes, jet engine intakes and many other airplane parts.

B. F. Goodrich heated rubber has other advantages. It can supply heat either in cycles to loosen ice so the airstream can carry it away—or constantly, to keep ice from forming. BFG heated rubber can be operated from the plane's regular power supply. It simplifies design, saves weight, can be cemented on.

Other BFG aviation products: tires, wheels and brakes; De-Icers; Avtrim, inflatable seals, fuel cells; Pressure Sealing Zippers; Rivnuts; hose and other accessories. *The B. F. Goodrich Company, Aeronautical Sales, Akron, Ohio.*

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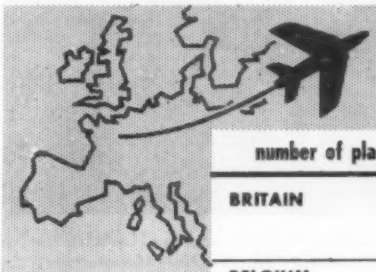
World's Largest Aviation Publishers
American Aviation

VOL. 18, NO. 1



WHAT EUROPE BUILDS FOR THE 'OFFSHORE' DOLLAR } **959 PLANES FOR $305 MILLION***

number of planes	plane type	total cost (in millions)	unit cost	initial delivery
BRITAIN				
465	Hawker Hunter	$140	$207,000	March 1955
107	Hawker Sea Hawk	$ 13	$119,720	June 1953
BELGIUM				
64	Hawker Hunter	$ 24	$234,206	March 1955
NETHERLANDS				
48	Hawker Hunter	$ 18	$234,206	March 1955
FRANCE				
225	Dassault Mystere IV	$ 87	$280,000	June 1954
ITALY				
50	Fiat F-86K	$ 23*	Not available	June 1955

*North American is being paid $29.5 million for parts supplied to Fiat, and $2.5 million for two prototypes.

Senate Report Hits Offshore Buying Program

Long awaited report brings foreign procurement operations under fire, calls for appropriations review.

By Preble Staver

THE U. S. Senate is giving serious consideration to strong recommendations for a searching reappraisal of foreign military and economic aid made by Senators Styles Bridges (R.-N.H.) and Stuart Symington (D.-Mo.). In a bipartisan report on their recent European survey of military preparedness the two Senators, in effect, have called for a halt to any new appropriations for foreign aid pending an adequate review of the program.

The long awaited report—three months in the making—packs a wallop. Its criticism of American assistance overseas puts particular emphasis on offshore procurement of aircraft and the potential of the Defense Department's "new look."

Coming at a time when the Senate is scheduled to act on foreign aid funds, the Bridges-Symington report:

• **Points out** that $442,265,000 of the $2 billion spent in offshore contracts, 20% of the total spent on military goods, was for aircraft, 959 fighter planes (see table).

• **Charges** that European industries, including the aircraft industry, rebuilt by U. S. aid, "have become formidable competitors of the same industries in the United States. Our own income has been and is being taxed to strengthen this foreign competition. . . . Offshore procurement acts as a form of U. S. subsidy for foreign products, many of which could be produced by American industry already expanded for defense purposes."

• **Urges** that "there must be hardheaded and experienced bargaining employed in all negotiations, so that practical benefit will be realized by the U. S."

• **Discloses** that the British Government's expansion and modernization of the Royal Air Force is being financially supported by the U. S. to the sum of about $260 million during the current fiscal year.

• **Suggests** that a portion of this aid may be finding its way into civil aviation development. "The principal reason advanced was that military and civil aircraft research and development are inextricably interrelated."

• **Questions** the ability of some offshore contractors, and particularly Britain's Hawker Aircraft Co., to meet the schedules established and expresses concern that some of these plants are within 20 minutes flying time of Soviet territory.

Bridges

Symington

The report is the result of a Senate Subcommittee visiting Britain, France, Germany, Italy and Spain between February 21 and March 6 of this year. The two principals in the subcommittee were Senator Bridges, chairman of the Appropriations Committee, and Senator Symington, former Air Force Secretary and now a member of the Armed Services Committee. The importance of the report is greatly increased by the committee positions of these two and their stature in this field.

Directed-procurement spare-parts contracts with two American firms overseas—Republic Aviation International and Curtiss-Wright, Europa, also came under the subcommittee's examination. The report discloses that Republic International's contract, subcontracting work in French plants, is to supply the USAF with spare parts for approximately 669 Republic F-84F aircraft at a

cost not to exceed $50,189,757. It is a cost-plus-fixed-fee contract allowing an 8½% profit with an incentive provision making profits up to 10% possible.

Curtiss-Wright Europa's contract covers delivery of sufficient spare parts for 340 overhauls and 944 maintenance periods plus rotating stock for Wright J65 engines. The work is being handled throughout Europe at a cost not to exceed $27 million plus $451,181 for general and administrative costs.

Urging "a strengthening of and compliance with regulations relating to contractural profits by Pentagon officials, based on adequate cost data and greater emphasis on competitive bids in awarding contracts," the report gets down to some specifics. Although most offshore procurement is done through negotiated contracts at prices not exceeding 117% of U. S. prices, the subcommittee found cases where even that ceiling had been waived.

Italy Cited as Example

Italy in particular was cited as a bad example of this.

The report states: "The contract for the assembly of 50 North American F-86K aircraft in Italy, which provides for purchase of all component parts in the U. S.—a very expensive procedure—is uneconomical; nor does it greatly increase the military production base in Europe. Although the contract is for $22.5 million, the total sum allocated is $54 million, because North American is being paid $29.5 million for parts and another $2.5 million for two prototypes. In this very uneconomical operation, the unit assembly price can not be arrived at."

The report dwells at length on the problem of Communist activities in Europe and again cites Italy as a particular problem: "In Turin (where the F-86K's are being assembled), 72% of the workers employed by Fiat, Italy's greatest industry, are members of the Communist union."

Bridges and Symington were not only critical of specific contracts. In more sweeping comments they questioned "who had authority to set the North Atlantic Treaty Organization forces in action."

The report states that the present arrangement "would seem to carry grave disadvantages in this air-atomic age. The problem revolves around what may be considered an act of aggression. By the time this question has been decided, it could be too late."

The big question now is: What comes next? Symington and Bridges suggest: "It is hoped these observations may have practical influence on current and future policy and operations."

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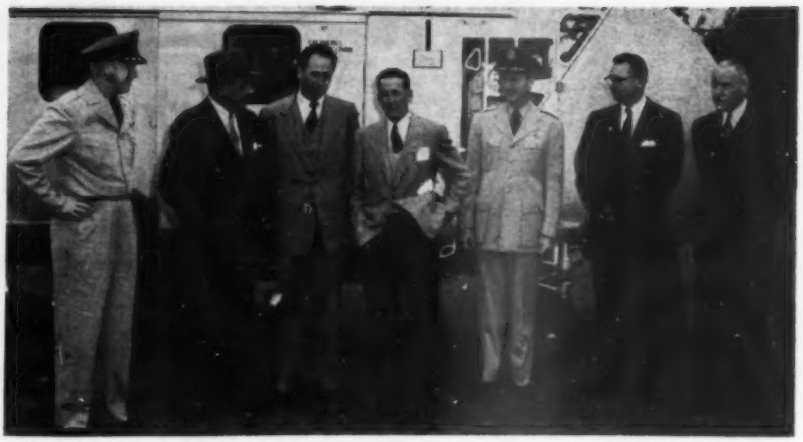


Sikorsky H-19 helicopter carried top level military and civil officials to the Aircraft Industries Association's Williamsburg, Va., meeting. Shown here alongside the four-star H-19 (left to right): Gen. O. P. Weyland, TAC Commander; Air Force Secretary Harold Talbott; Ass't AF Secretary Roger Lewis; Thompson Products and AIA Board Chairman Frederick C. Crawford; Brig. Gen. W. G. Hipps and Trevor Gardner, both of the Office of the Secretary of the Air Force; and Admiral D. C. Ramsey (USN, Ret.), president of AIA.

Strauss Tells AIA of Atom Prospects

IN one of his rare public comments on developments in the field of atomic power, Rear Admiral Lewis L. Strauss, chairman of the Atomic Energy Commission, has assured the aircraft industry that he is "strongly behind" the program for nuclear powered aircraft and that the program shows great progress and promise.

Strauss appeared before the Aircraft Industries Association at its eighth annual executive session in Williamsburg, Va., in mid-month were 125 of the aircraft manufacturing officials met to discuss current problems. Eighteen aircraft company presidents were on hand for the program.

Roger Lewis, Ass't AF Secretary for Materiel, who is generally recognized as the official spokesman of the Defense Department in matters relating to aircraft and engine production, gave the AIA this picture of industry outlook:

• **For the first time** in the industry's history it can look forward to a continued program of aircraft production without periodic peaks and valleys. Expenditures for aircraft procurement will continue to decline slightly, so that expenditures during the next three years will be about 20% under those of the past three years, but will remain at a reasonable working level. Practical scheduling is the key to this program.

• **A defense plant dispersal policy** does exist and, without specifically relocating major companies from the West Coast, will be gradually implemented. This is highlighted by Defense Department interest in keeping plants such as Lockheed-Marietta, Boeing-Wichita, Douglas-Tulsa, etc. in the program.

• **So-called "crash" programs,** production contracts to assure rapid production with almost complete disregard of cost and related problems, are at an end. From here on out a premium will be placed on higher quality, particularly quality as it is reflected in performance of the aircraft and its systems.

Strauss told the AIA about shielding developments that are under way which promise to minimize radiation problems associated with nuclear powerplants. One of these is an ordinary water shield which has proved very effective in isolating radiation. This has been tested in a so-called "swimming pool" at Oak Ridge. Another phase of the testing involves use of a lead shield immediately under a reactor mounted 150 feet off the ground. This proves very effective in isolating harmful radiation such as might be experienced in areas adjacent to airports.

Deputy Chief of Naval Operations Vice Admiral Ralph A. Ofstie, in a paper titled "A Look Ahead in Naval Carrier Operations," told the industry that for some time to come the Navy's principal emphasis will be on a lighter aircraft. He outlined the Navy's plans with the Forrestal-class carriers and said a program is going ahead to adopt the British-developed canted deck and steam catapult.

Ofstie pointed out that the British had been able to lead in these developments despite their relatively small research and development budgets. He also said the Navy will restore the "island" on aircraft carriers.

Collins Named New Northrop President

Whitley C. Collins, 56, has been named president and chief executive officer of Northrop Aircraft, Inc., to succeed the late Maj. Gen. Oliver P. Echols. Collins, who had been head of Northrop's Radioplane Co. subsidiary, will also retain that title, but has made some shifts in the Radioplane executive setup to give him more time for the parent company.

Collins

Collins has been a Northrop director since 1952. Northrop's board of directors postponed until a later date the selection of a board chairman and director to replace Gen. Echols.

Contracts Let for F-102 and RF-101A

A synopsis of new contract awards indicates that Convair Division of General Dynamics Corp. has received contracts totaling $74,942,059 to produce 37 delta-wing F-102 interceptors and 20 TF-102A trainer-interceptors.

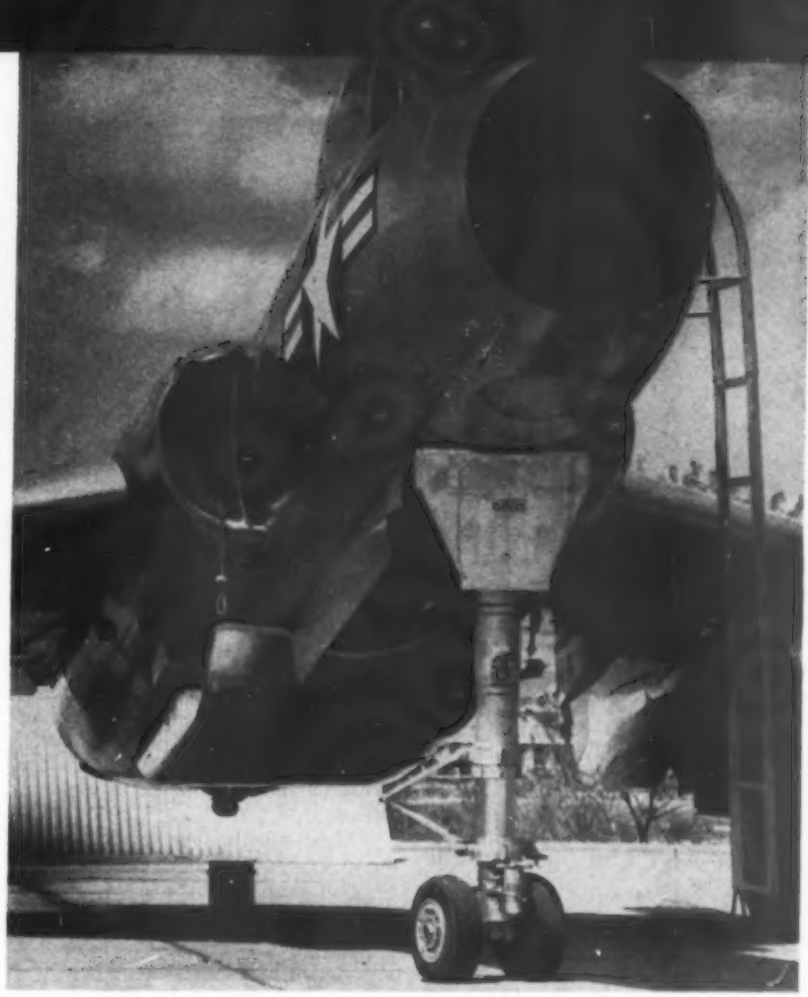
McDonnell Aircraft Corp. simultaneously received orders for 28 RF-101A's, spare parts, and special tooling for a total of $34,025,262, and $926,067 for parts for the F2H Banshee.

SAC Refueled in Air 16,000 Times in 1953

Gen. Curtis E. LeMay, Commander of the Strategic Air Command, spelled out the increasing importance of in-flight refueling to SAC missions in a recent address before the Armed Forces Chemical Association at Washington, D. C.

Noting that SAC bombardment units can now move "over much of the world with comparative ease," LeMay said, "Last year, our planes made just under 16,000 hook-ups with tanker aircraft at predetermined rendezvous points, transferring 11,000,000 gallons of fuel. This averages out to a refueling operation each 15 minutes every day of the year."

LeMay expressed no doubt that SAC crews could "hit the target when they get there." He was not as definite that SAC planes could be entirely successful in penetrating enemy air defense systems, noting that the penetration aspect is much more difficult to evaluate in training maneuvers. He concluded, "Our experience shows that we can do our job."



Fuselage rocket pack for the Chance Vought F7U-3 holds 2.75" Mighty Mouse air-to-air missiles. The Cutlass can also mount two rocket pods, carrying up to 19 such rockets, on its wing pylons. The fighter is also armed with 20 mm cannon, and can carry guided missiles. The pack can be reloaded.

Convair Disputes Claims for Viscount

The Convair Division of General Dynamics Corp. has issued a statement declaring that Vickers-Armstrongs, Ltd.'s claims comparing the turboprop Viscount and the Convair Liner "are not the whole truth."

Vickers recently put forth some published data asserting that the Viscount, which uses four Rolls-Royce Darts, is more economical, faster, and cruises at higher altitudes than the Convair Liner, which employs two Pratt & Whitney R-2800 piston engines.

Convair, while declaring it is "fully aware of the future possibilities of turboprop commercial transports," added that "our own cost studies, and figures presented to the CAB . . . definitely show the piston-powered Convair Liner less expensive to operate . . ."

The U. S. manufacturer noted that 85% of all airline trips are 300 miles or less. "For this kind of trip—block to block time—the Convair Liner's record is nine miles per hour faster than the Viscount."

As for the high altitude flights, Convair declared the Viscount's advantage is usually an unusable feature. Even though the British plane can cruise at 25,000 feet, that is no particular advantage, Convair said. "In the 300 mile range . . . the optimum altitude for both planes is approximately 15,000 feet."

Comparing the break-even points of the two planes, Convair said first class and tourist Convair Liners (44 and 48 seats) need 51.5% and 59% of the seats filled on a 300-mile flight. The Viscount (40 and 48 seats) needs 72.5% and 76.8% of the seats filled on a similar flight, Convair said.

The San Diego company's director of contracts, J. G. Zevely, gave the following cost-per-seat-mile figures:

First class Convair Liner—300 mile run (1.73¢), 600 mile run (1.54¢).

First class Viscount—300 mile run (2.80¢), 600 mile run (2.50¢).

DORSAL FIN on Fairchild version of Chase C-123B is prominent in photo above. Height of rudder has also been increased. Mass production is due by end of year.

First Fairchild C-123B Due in July

The Fairchild production version of the Chase-designed C-123B assault transport will incorporate a number of changes.

With modification work essentially completed on the Chase aircraft now undergoing tests at Fairchild Engine and Airplane Corporation, Hagerstown, Md., Fairchild officials expect to complete their first C-123B, including modifications, by July.

By the end of the year, mass production for the current order of 164 C-123B's is scheduled to get under way on a production line now paralleling that of the Fairchild C-119 Flying Boxcar.

One of the principal external changes made was the installation of a dorsal fin between the leading edge of the rudder and the top side of the fuselage. First flight with this alteration was made on April 9. Height of the rudder has also been increased, Fairchild officials report.

Three aerodynamic problems discovered in the C-123B brought about the changes. Fairchild listed them as (1) excessive rudder and elevator forces, (2) directional oscillation and loss of rudder effectiveness in power approach configuration, and (3) elevator control oscillation during turbulent flying conditions.

Eight modifications made on the model by Fairchild in conjunction with the Air Force include: (1) putting spring tabs on the rudder and elevator, (2) installation of the dorsal fin, (3) improved powerplant installation (cowl flaps and other minor changes), (4) redesign of paratroop doors, (5) redesign of pilots' corner windows for better visibility, (6) addition of main landing gear doors, (7) improved antenna installation to reduce drag, and (8) improved de-icing installation to meet specifications.

Up to mid-May, Fairchild made 59 flights with the C-123B, which totaled 55 hours. It received the assault transport on December 15, 1953.

Convair's YC-131C, this country's first twin-engine turboprop military transport, made its first flight on May 20, from Carswell AFB, Ft. Worth, Texas. The YC-131C is one of two prototypes being used as turboprop test beds.

Ramo-Wooldridge Gets USAF Research Contract

Ramo-Wooldridge Corp., Los Angeles, which was set up last fall by two of Hughes Aircraft Co.'s top scientists, has received a $39,378 contract from the AF's Air Research and Development Command to conduct research on "Long Range Analytical Studies of Weapons Systems."

Dr. Simon Ramo and Dr. Dean E. Wooldridge, have been joined by Gen. Harold L. George, who also quit last year as Hughes Aircraft's vice president and general manager. George has become a director of Ramo-Wooldridge.

1953 Airline Salaries

Following are 1953 airline salaries as reported to CAB:

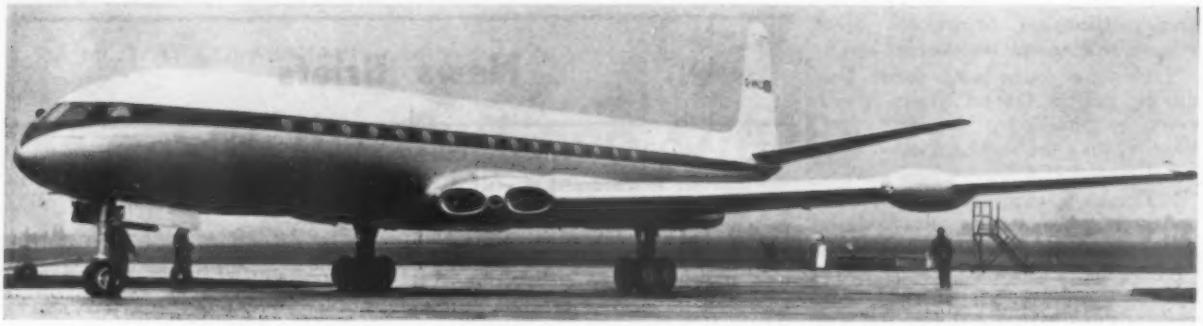
EASTERN AIR LINES, INC.

E. V. Rickenbacker, chm. of bd., gen. mgr. and dir., $50,000 salary (entered office August 7, 1953), $13,482.36 bonus and indir.; **T. F. Armstrong,** pres. and dir., $27,500 salary (up $5,625) (entered office August 7, 1953), $4,420.87 bonus and indir.; **P. H. Brattain,** 1st. v.p. and dir., $31,000 salary (up $1,000), $6,829.20 bonus and indir.; **S. L. Shannon,** 2nd. v.p. and dir., $28,500 salary (up $1,000), $4,784.50 bonus and indir.; **T. E. Creighton,** treas., asst. secy. and dir., $13,000 salary (up $3,916.67) (entered office August 7, 1953), $1,108.92 bonus and indir.; **L. P. Arnold,** v.p., $22,500 salary, $3,664.84 bonus and indir.; **M. M. Frost,** v.p., $26,000 salary (up $1,000), $2,960 bonus and indir.; **W. Van Dusen,** v.p., $20,000 salary (up $1,250), no bonus and indir.; **C. Froesch,** v.p., $13,200 salary (up $2,300), $2,321 bonus and indir.; **J. H. Brock,** v.p., $18,500 salary (up $1,000), $2,357 bonus and indir.; **R. Ramspeck,** v.p., $17,500 salary (entered office January 1, 1953), no bonus and indir.; **F. L. Farley,** secy. and asst. treas., $13,200 salary (up $2,300) (entered office August 7, 1953), $1,335 bonus and indir.; **W. R. Blackwood,** comptroller, $15,000 salary (up $2,500), no bonus and indir.

•

WESTERN AIR LINES, INC.

Terrell C. Drinkwater, pres. and dir., $54,375 salary (up $14,063), $650 bonus and indirect compensation; **Stanley R. Shatto,** v.p.-operations and dir., $29,767 salary (up $5,332), $650 bonus and indir.; **Marvin W. Landes,** v.p.-service and dir., $24,733 salary (up $6,036), $650 bonus and indir.; **Paul E. Sullivan,** v.p.-adm. and secy., $24,733 salary (up $6,036); **Arthur F. Kelly,** v.p. sales, $24,733 salary (up $6,036); **J. Judson Taylor,** v.p. and treas., $24,733 salary (up $6,036); **D. P. Renda,** asst. secy., $22,721 salary (up $6,300); **C. J. J. Cox,** controller and asst. treas., $15,831 salary (up $3,877).



COMET III, rolled out at de Havilland plant, shows larger air intakes and round windows.

Britain Waits for the Answer on the Comet

Will the bold gamble of jet transport development prove to be disastrous for the British?

By Anthony Vandyk

LONDON—These are grim days for the British aircraft industry. The black outlook for the Comet II, coupled with the probability—almost the certainty—that the Comet I will never see commercial service again, has cast a spell of gloom which is felt even by companies which have no connection whatsoever with the de Havilland jetliner program. Despite the good record of the Vickers Viscount to date, many Britons are asking what has gone wrong with the nation's turbine transport manufacturing industry.

Although for the general public it is just the Comet that is "wrong," in industry circles both here and in continental Europe, the feeling is that the Bristol Britannia is not progressing anything like as well as it should. Responsible individuals in the trade are reconciled to the prospect of BOAC being without Comets or Britannias, for passenger work at least, until 1956.

This sad state of affairs results from Britain's enterprise (some might call it foolhardiness) in putting all her big transport eggs in the turbine aircraft basket. It was a risk staking everything on a type of powerplant which had nothing but military experience and not very much of that. The British government knew it was a risk as well as did the companies which actually took the risk. It is still premature to say that Britain's bold policy did not pay off.

The main loser to date looks like The de Havilland Enterprise, as it styles itself. The de Havilland companies have upward of $14 million invested in the Comet. As a vital component of the British defense production set-up, de Havilland will never be allowed to go out of business. Nor, for that matter, would the British government ever let Bristol be liquidated (Bristol's investment in the Britannia is relatively far greater than de Havilland's in the Comet).

It isn't easy to put into words the impression obtained from visiting the de Havilland plant at Hatfield where all Comet production work is at a standstill.

In the executive offices there is an air of grim determination to see the thing through—to get to the bottom of the high-altitude accidents. The lack of activity around the partly completed Comet II's and the various Comet I's and II's parked outside the shops gives the visitor the impression that it is a Sunday, not a working day.

Seven Days a Week

To de Havilland, however, the Comet situation has meant the end of Sunday as a day of rest for its executives and technicians. They are working every day and most nights on the problem, as are the specialists at Farnborough, the Royal Aircraft Establishment, which has been made primarily responsible for determining the cause of the Comet accidents. The Farnborough investigation is being conducted on a top-priority, expense-no-object basis by personal order of Prime Minister Winston Churchill.

In addition to the Comet prototype which is being vibrated to destruction point under a program initiated last year, Farnborough has been assigned two of BOAC's Comet I's; a further two have been given back to de Havilland for the manufacturer's investigation program.

Both Farnborough and de Havilland are working in close cooperation to find a solution. The Air Registration Board, Britain's certification authority, is in close contact with both.

Indications are that the ARB (which includes representatives of de Havilland and BOAC) will not certificate any de Havilland jetliner (Comet I, II or III) until the cause of the high-altitude accidents has been positively established and rectified. This means that some Comet II contracts may lapse, since many are believed to contain clauses requiring the aircraft to be certificated by certain dates.

The position with regard to operators is extremely delicate. There has has been some discussion in France about legal action to obtain compensation for losses in revenue suffered by Air France and UAT-Aeromaritime as a result of the withdrawal of the Comet I's certificate of airworthiness on government instruction.

Incidentally, both Air France and UAT are still Comet enthusiasts and describe it as one of the most "bug-proof" aircraft they can recall.

Despite their confidence in the de Havilland design, both French operators admit that the public will not fly in Comets until there has been positive proof that whatever caused the high-altitude accidents has been found and that measures have been taken to prevent a repetition.

What did happen? There are still a million and one theories, but the one most voiced by industry leaders is that of the fuel forming an explosive vapor and igniting. It seems that this could have been the cause of the two accidents off the Italian coast.

Reliable reports indicate that both aircraft were refueled from the same stock at Rome and that the kerosene in question was produced in Italy and was not, on analysis, found to be of the same standard as that refined in Britain. It is significant that a kerosene fuel truck used for BOAC Comets at

Rome's Ciampino airport has been shipped to England for examination.

This is of course just a theory. For the last accident, that off Naples, it will never be possible to do more than theorize, since the wreckage is too deep for salvage.

Thanks to tremendous perservance and skill by Royal Navy salvage crews using special television apparatus, about 95% of the Elba wreckage has been recovered and is being attached to a wooden mockup of the Comet at Farnborough. When this jigsaw puzzle of bits and pieces (many badly distorted) has been put together it may give a lead as to how and why that aircraft broke up.

Future Prospects

What of the future? The Comet III, grossing 150,000 pounds and powered by Rolls-Royce Avon RA 16's of over 10,000 pounds each, has been rolled out and is now just about ready to fly. If the ARB allows it to take to the air, the latest de Havilland jetliner might well be of use in helping to solve the riddle of the accidents.

Production plans for the Comet III are frozen, and if it is decided to move into the production phase many modifications to the previous program will be required. It is known that ARB will insist on many changes in the basic Comet design as a result of the investigation of the Comet I accidents.

Production in 1956, as originally scheduled, is virtually ruled out. It is now more of a question whether there will be any Comet III production.

Industry leaders sincerely hope that the Comet I accidents will not mean the end of the Comet program. Everyone acknowledges that de Havilland's pioneering work with the jet transport has been of benefit to the world's aircraft industry. It is felt that in the interest of aeronautical progress everything possible must be done to keep de Havilland in the jetliner business.

• • •

Navy to Increase Rate Of Missile Procurement

Procurement of guided missiles will be stepped up by the Navy's Bureau of Ordnance, it has been revealed by Rear Adm. Malcolm F. Schoeffel, chief of the Bureau.

Schoeffel told the Senate Military Appropriations Subcommittee: "All (ordnance and ammunition) programs are planned at lower levels in FY 1955 than in FY 1954 with one notable exception . . . the guided missiles field."

News Briefs

MANUFACTURING

Convair is scheduled to start flight test operations at Palmdale on June 15. Flight tests on the F-102 delta-wing interceptor will then be going forward both at Palmdale and at Edwards AFB . . . **Ten per cent of titanium production** will be available for civilian use, under the terms of Defense Services Administration Order M-107. No producer will be forced to accept military orders exceeding 90% of his scheduled production in any month . . . **Higher profits for the industry** this year have been forecast by Gen. Edwin W. Rawlings, commander of the Air Materiel Command at Dayton. Rawlings told the Wings Club that 1954 totals should exceed the "very handsome" 1953 profits.

Higher profits have already shown up in the Fairchild Engine & Airplane Co. ledger. First quarter net is reported at $1.2 million, up from $894,000 for the similar period last year . . . **The Aircraft Industries Association** has decided against sponsoring an aircraft show similar to Britain's Farnborough display, but will cooperate with the Labor Day aircraft show at Dayton, Ohio.

MILITARY

The XB-58 "Hustler," supersonic delta bomber, is going ahead on schedule, according to the USAF; it is not being rushed as a result of the appearance of a Russian long range bomber . . . **The Air Force has advised** its personnel to consider commercial air transport as a "normal means of transportation."

AIRLINES

A non-fatal crash of an American Airlines Convair 240 at Buffalo, N. Y., on January 20 has been ascribed to the mechanical failure of a torque-meter boost pump, which feathered a propeller. Also at fault was incorrect procedure that was used in unfeathering the propeller, according, to the CAB . . . **A complete radio communications system** has been approved by the FCC for Los Angeles Airways, to expedite its helicopter mail and express operations . . . **First emergency hospital heliport** has been set up by New York Airways at the North Shore Hospital, Manhasset, N. Y. . . . **United Air Lines** heralded the start of its DC-7 operations by flying a one-stop "dawn-to-dusk" flight from New York to Honolulu. The DC-7 left N. Y. at 7:09 a.m. (EDT), and arrived in Hawaii at 6:45 p.m. (HST).

Despite an operating profit of almost $41,000 Mohawk Airlines has reported a 1953 loss of $34,550. Non-operating expenses took the carrier into the red . . . **An order for four or five** long range U. S.-built transports is expected from South African Airways within the month. Planes will be either Lockheed Super Constellations or Douglas DC-7's.

Boeing 707 jet transport/tanker, shown above as it emerged from its hangar in May, suffered a set-back a week later when the left landing gear collapsed during taxi tests. Damage was slight, being limited to part of the wing flap, some skin, and the bottom surfaces of the two left engine nacelles. A delay of several weeks before the first flight was expected as a result.

A MILITARY COMMENTARY . . .

Off the Cuff and Off the Track

PERHAPS the most "misunderstood" man in the Pentagon is Air Force Secretary Harold E. Talbott. He rates this distinction in our book because of his consistency in making verbal bloopers.

Uttering the wrong thing at the wrong time has plagued the civilian air chief during the past year. His words are now being well screened ahead of presentation, whenever possible.

Although Talbott is aware of his vocal blunders and now weighs his statements carefully, his Pentagon cohorts still keep their fingers crossed and hold their breath when Talbott speaks. They are particularly wary of his "off-the-cuff" addresses.

They hate to think about his rather recent "off-the-cuff" comments made at Link Aviation's 25th anniversary get-together at Binghamton, N. Y. In his remarks to a large group there, he referred to the immense power in the Boeing B-52 bomber. He mentioned its engine afterburners. The Pratt & Whitney J57's on the B-52, however, do not have afterburners, AF officials quickly reported.

In addition, Talbott heaped praise on Link's work in the electronic flight simulator field, saying he hoped that Link would be just as successful on the B-52 simulator. Only drawback in this statement is that Curtiss-Wright is building the B-52 simulator.

Remarks of this nature, of course, are not very damaging. A man who speaks at as many functions as Talbott can not be perfect. But some of the things he has said haven't helped the U. S. and its efforts to get along with its international neighbors.

Hassles in Spain

For instance, Talbott has goofed on a number of occasions regarding Spain. When he was in Spain last fall, he was reported to have said that the U. S. was going to store atomic bombs in Spain at the AF bases now being constructed there. This stirred up considerable concern among the U. S. allies.

Defense Secretary Charles E. Wilson crawled on his AF chief for this one, we were told. In the outcome, however, it was claimed by the Pentagon that Talbott was misquoted and that A-bomb storage in Spain was not so. Perhaps he was right in this case. We weren't there at the time.

But we know an indiscreet comment that Talbott and his Potomac Puzzle Palace friends can't charge "misquote" on. We heard it at a Pentagon press conference. Again on Spanish bases, Talbott was asked by the press if they would be available to the U. S. in wartime. His spontaneous response:

"They are available—well, sure, they are. We have certain arrangements on what we are to use them for, but if the balloon goes up, we will go right ahead and use all those bases. No question about it. Who is going to keep us from it?"

Even Wilson sitting at Talbott's side appeared somewhat startled by Talbott's outburst. Wilson's immediate footnote to the group: "I think the thing is a little bit around the other way, that the Spaniards have more to do with them in peacetime and less to do with them in wartime."

After the conference, AF public information officials scurried to form a retraction of the Talbott tongue slip. It was soon after released by Talbott "to clarify the statement attributed to me at Mr. Wilson's press conference." It read:

"The U. S. Air Force has every intention of living up to the agreements made between the United States and those foreign countries that have granted air base rights to our country. We realize that such base rights are an undertaking in the mutual defense and we enter such undertakings with every spirit of cooperation."

More recently, the 66-year-old former Chrysler executive has gotten into hot water for speaking about Air Force Academy sites. At a time when no AF people were supposed to breath a word about its possible location, Talbott told a group at Battle Creek, Mich., that he considered this area an "ideal site." Even if it is (but we're banking on Colorado Springs), he shouldn't have said it.

In an opposite vein during a Texas trip, the air secretary referred to a Texas site as something like either a swampland or a mud puddle, not fit for the academy's location. This put him in the soup in the eyes of Texas.

Despite Talbott's careless chatter, he's known as a good speaker. On the whole, his talks have benefited the AF cause a great deal. And he's made a lot of them in more places throughout the world than any of his predecessors.

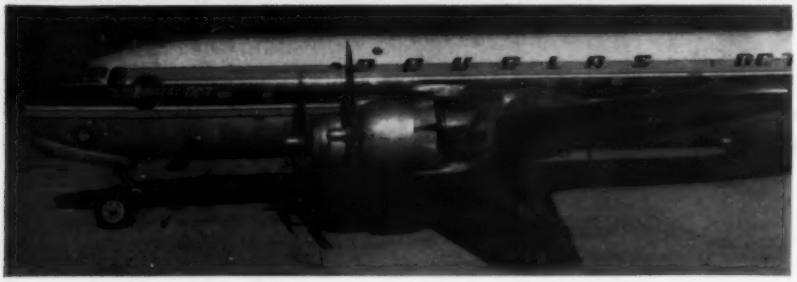
Most traveled government official during 1953, he has logged more than 160,000 miles, visiting more than 175 bases and installations. Such extensive journeying has brought forth comment that he overdoes it, is never around, and should stay in his office more.

We can't go along with such criticism. We feel he deserves a great deal of credit for these extensive trips, despite some of the things he has said en route. By now he knows the overall AF picture as well as anyone, and such knowledge at top level is perhaps the most important bit of intelligence necessary for a smooth-running military organization.

While we're in the positive area of discussion, it should be worth mentioning Talbott's trip to Thule AFB, Greenland, last New Year's Eve. His conversion of an AF transport into an egg-nog tanker, replete with feminine musical entertainers, for the Thule airmen was indeed a worthy effort.

Summing up, it should be noted that the AF is in good shape, budget-wise and otherwise, compared with the other services. AF military leaders are optimistic about this. This, of course, reflects on the head man, Talbott. When he leaves this post, which may be soon, his contribution will be well on the plus side, despite the vocal ineptness he has occasionally displayed.

. . . HARRY S. BAER, JR.



BULGES over the engine nacelles show how extra fuel tanks are installed in the Douglas DC-7B to add to the range of the intercontinental version.

DC-7B May Fly Atlantic Nonstop

"Saddle tanks" over engine nacelles boost fuel capacity to 6400 gallons, make westbound ocean flight possible.

By Fred S. Hunter

FLIGHT TESTS for CAA certification of the intercontinental version of the DC-7 will be completed with a production model which the Douglas Aircraft Co. now has under construction and will retain for its use in test and development.

This will enable the company to release the No. 2 American Airlines plane, which it has been using for its DC-7 test work, including aerodynamic tests on the "saddle" tank fairings for the DC-7B, back to the shop for completion for passenger operation and delivery to the carrier.

Higher Gross Weight

Newest development in the evolution of the DC-7 is a further increase in the maximum allowable gross take-off weight for the overseas version from 125,000 to 126,000 pounds. (Maximum for the domestic DC-7 has been 122,200 pounds.) Landing weight of 102,000 pounds and zero fuel weight of 96,000 pounds are unchanged.

Douglas engineers are projecting DC-7B performance for operation westbound across the Atlantic nonstop from either Shannon or Prestwick without a refueling stop at Gander or other intermediate point. These projections show the DC-7B can be operated nonstop to New York from Prestwick on an 11-hour schedule during the winter months and on a 10 hour and 15 minute schedule during the summer.

Optional 90 Gallons

Fuel capacity of the DC-7B has been boosted from 5512 to 6400 gallons with the addition of external "saddle" tanks located on the upper wing surfaces as part of larger nacelles. An additional 90 gallons of fuel capacity in center wing trailing edge tanks is optional.

No increase in drag accrues from the nacelle modifications, because the nacelles, while longer, are better shaped and are cleaned up aerodynamically.

The tanks are to be installed as a modification on the Douglas plane, which will be used to complete the CAA flight tests in September. This plane will still have the present DA2 Turbo-Compound engines, as the Wright company is not scheduled to start shipping the new DA4 engines from the factory until October.

It is the added 100 hp in low blower climb in the DA4 that makes the increase in allowable gross take-off weight possible in the DC-7B. However, the required CAA tests probably can be expedited by using the DA4 powers with the DA2 engines in the plane.

Additional Modifications

The intercontinental version of the DC-7 represents a number of additional modifications as compared with the domestic models now being flown over U.S. routes by American, Delta, National, and United. There are heavy reinforcements in wing and tail, including a bigger spar cap, and the landing gear has been beefed up some.

One of the more important improvements is a new flap linkage system providing optimum position for take-off. Through a relocation of the flap and vane with reference to the upper wing surface, the airflow characteristics over the flap have been improved to provide greater lift.

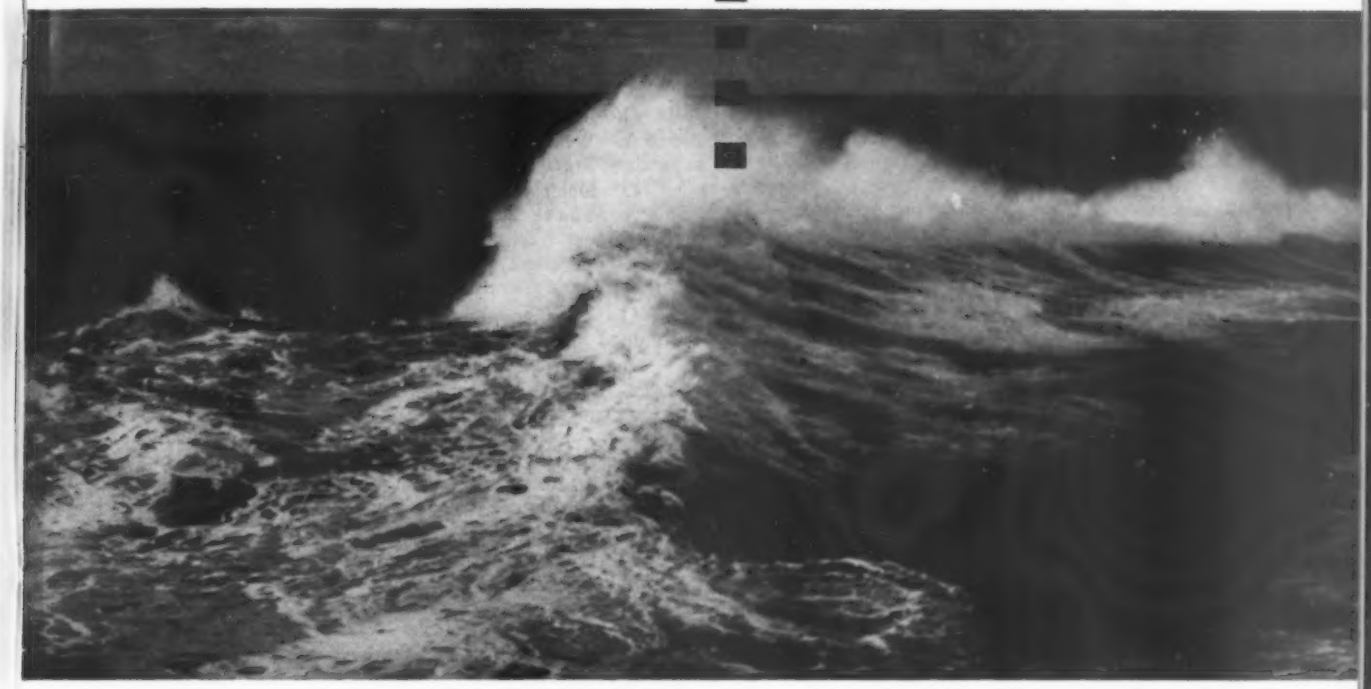
Better soundproofing is another prospect for the DC-7B. Tests of new soundproofing have been conducted in an American Airlines plane and reports are highly favorable. It adds 390 pounds, but is said to more than make up for the extra weight by greatly improving the ride in the forward sections of the cabin.

Another Go-Around

The fact that Douglas is taking a DC-7 out of the line and tagging it for continued test and development use reflects the feeling that piston engines are in for another go-around in the world transport market. Actually, most of the flight testing for CAA certification of the DC-7B already has been accomplished with the No. 2 AA plane. This makes it evident that Douglas feels it will be profitable to strive for still more growth in its present line of transports.

Douglas is now running well ahead of schedule in DC-6/DC-7 production and, if there are no interruptions, this means more 1955 delivery positions will open up as time goes on. Among carriers reported exhibiting renewed interest in the DC-7B are SAS, Sabena, KLM and Swissair. None, however, have placed actual orders, leaving Pan American World Airways as the only overseas carrier with a firm commitment. • • •

TOP SECRET



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Interview

with

T. Claude Ryan

President

Ryan Aeronautical Corp.

• • •

A Missile Role for the Ryan Firebee?

• • •

T. Claude Ryan, president of Ryan Aeronautical Corp. and member of the AIA Board of Governors, founded his company in 1928. The company has produced over 20 advanced planes, including "The Spirit of St. Louis," primary trainers, the Navy's first jet and first turboprop, and the first Air Force air-to-air missile. Ryan is also responsible for development of the present target drone, the Firebee.

Ryan, a native of Parsons, Kans., attended Oregon State College. He learned to fly at Venice, Calif. As an Army Air Corps cadet, he trained at March Field and was commissioned a second lieutenant in 1921. After flying the U. S. Forest Patrol for one year, he founded the Ryan School of Aeronautics in San Diego. In 1924 he started Ryan Airlines, one of the first carriers. During World War II, the school trained 14,000 pilots.

Today, Ryan Aeronautical is producing aircraft drones, electronic equipment, jet engine components, rocket exhaust systems, fuel tanks, and other accessories.

Q. What figures can you give us regarding the Firebee?

A. The only performance figure which has been cleared for release was used in connection with our sucessful two-stage recovery system. These published reports stated that this system has been tested in operation at speeds up to 600 miles per hour.

In general the Firebee has a span of approximately 12 feet, length is 18 feet, and power is provided by a 1000-pound-thrust Fairchild J44 or Continental-Marbore J69.

Firebees are launched either from the belly or wings of a twin-engine "mother" plane, or from rail or zero-length ground launchers. Freed for flight, they can demonstrate performance comparable to that of modern jet fighters.

Q. In what category do you place the Firebee?

A. Well, it is officially classified as a drone—that is, a pilotless target vehicle.

Q. Don't you mean a pilotless plane?

A. You've hit on one of the problems we have in getting proper recognition for the Firebee. Since it has no pilot, it's not usually listed with U. S. Military Aircraft—but this implies aircraft which are piloted.

Q. Then you mean the Firebee's more properly in the guided missile category?

A. It's not a guided missile in the sense that it carries a warhead, but it's more properly in this than in any other category. You won't find the Firebee on official Guided Missile lists. It has all the necessary attributes of a missile—electronic remote control, no pilot aboard, high-speed jet performance, etc.—but it wasn't designed to carry a warhead; therefore, it's not a guided missile, as now being operated.

Q. Your recent annual report stated that "other applications" of the basic Firebee design are under study. Is it being redesigned as a missile?

A. The design characteristics of the Firebee are such that it obviously can carry additional payload. This could be used for any item of armament or other equipment within its weight and size limits.

Q. Is the Firebee capable of being equipped with an atomic warhead?

A. You would have to figure that one out, I think. We think it has a lot of applications.

Q. How many pounds of additional equipment do you feel the Firebee could carry?

A. In my opinion, for an air-launched mission about 500 pounds, without materially affecting the range.

Q. Since you appear to feel there is no need for additional gross weight for this vehicle, or for greater range, why the changed engines?

A. Firebees are being equipped with both the Fairchild J44 and Continental J69 powerplants to employ the specific advantages which each engine possesses for different flight operations.

Q. Is the Firebee capable of taking evasive action?

A. Yes, it simulates jet fighter maneuverability under the full control of a "pilot" on the ground and out of range of sight. It flies so fast and so high that you can't see it a few seconds after it is launched.

Q. Would it be reasonable to predict a true Ryan guided missile?

A. That's possible, but I don't want to leave the impression that we have a complete guided missile of our own with all the components designed and developed by us. We are building rocket powerplants. We are also building guidance systems, and those are two main parts; the body of the missile is simple.

'On the reverse thrust band wagon'

Q. What is the magnitude of production on the Firebee at the present time?

A. Not very large. We are in production but we are not in the volume of production that we are capable of or would like to see. A relatively small part of our $50 million business in 1953 was involved in the Firebee production. We feel that the prospects are bright for production on a larger volume basis.

Q. What prompts this optimism—the Firebee's potential as a target drone?

A. The target drone field is large, we feel, for a high-speed, high-performance target drone, and the Firebee is the only drone in that field that has been proven. It has been announced that there is a Firebee test program going on at Holloman Air Force Base; another at Point Mugu by the Navy; and there will be another Army test program coming up. There has been no identification yet of any operational activity. Obviously when the Firebee gets into operational use our volume should go up.

We have an increasing arsenal of defense weapons, weapons to shoot down aircraft, either in the air or from the ground. Target practice is needed to keep crews in training. What have they got to shoot against that is of comparable performance to targets that would be involved in a war? They have some piloted aircraft that have been converted to drones, slow speed drones, and tow targets which are not comparable in speed or evasiveness to enemy aircraft. The Firebee is the only thing that we know of that can be utilized from a practical standpoint other than converted fighter airplanes, and they are not suitable as their first cost and operating cost are vastly higher.

Launching Methods

Q. You have ground launching and air launching of the Firebee. Which is the best method?

A. It depends somewhat on the user. The Firebee is a joint project of the U. S. Air Force, Army Ordnance, and U. S. Navy. Its Air Force designation is Q-2; the Army Ordnance model is known as XM21, and the Navy version is KDA-1.

The Army prefers ground launching to provide greater independence; the Navy wants surface launching for some applications fired off ships. The farther you carry it without flying it, of course, the farther the missile range from the point of take-off.

Q. My understanding now is that the Army and Navy versions use the J44 and the Air Force version the Continental-Marbore J69. What are the relative advantages of one over the other?

A. The Fairchild J44 engine has higher thrust ratings at some altitudes. The Continental-Marbore J69 has a higher compression ratio, which means more fuel economy and range.

Q. Could you give us some idea of the unit cost of a Firebee?

A. You can say it is a small fraction of what it would cost to use a true alternative, such as a converted jet fighter. That's the only alternative. It was designed from the beginning with great emphasis on low cost and adaptability to volume production and economy. We think we have accomplished that to a good degree.

We haven't had a chance to get the full benefit because the quantities have not been large enough. But it is a very simple design, a minimum number of parts involved.

Q. There's been a great deal of interest recently in vertical take-off airplanes. When the first news recently broke in the press on the Lockheed and Convair vertical take-off airplanes a report was circulated that Ryan was also active in this field. What can you tell us about this?

A. Ryan is working on a great many projects in many different fields of research and development. Because these contracts are classified, I cannot discuss any of them.

Q. Do you feel that the straight jet engine, as such, is going to have a new role in the vertical take-off aircraft as compared to (1) the turboprop and (2) a by-pass engine?

A. There are no by-pass engines suitable for this application so I can't answer that one. On turboprop VTO's it should be obvious that the propeller will impose limitations.

Q. Are you in the reverse thrust business?

A. You might say that we are on the reverse thrust band wagon. We are doing our best to design the best reverser there is and we think we may have it, but the other fellow may surprise us and have a better one. If he has we will build his for him. We aren't testing our design yet, but it is beyond the paper stage.

Q. Are you working with the military on it, or is it primarily being built with your own development money?

A. We have put our own money in it.

Q. Could you be ready to have your unit flight-tested this year?

A. I think we could.

Q. Are the afterburners you manufacture of your own design?

A. No. We are building six different types of afterburners. We have been in this field ever since it started. We are building afterburners of the jet engine manufacturers which incorporate many of the ideas that we originally developed.

Q. Is it a matter of company policy to be more interested in afterburner production than in design?

A. We got into the afterburner field early, during the latter part of World War II, when we received a contract to develop knowledge about afterburner design. Then the military decided that the afterburner should not be considered a separate accessory because it so directly affected the engine itself and the engine manufacturer should design it as a part of the engine. That's the course that was followed.

Today's afterburners are designed by the engine manufacturer. We cooperate with him in helping to design them to stand up, but in the final analysis the engine manufacturer approves it or disapproves and it becomes his design.

Q. Ryan is reportedly doing some radar work; would you elaborate on that?

A. We have Air Force and Navy contracts in this field. We also have projects that have been carried along with company funds. We have explored the field of continuous wave radar and are actively engaged in developing the equipment for it. As a result of our work some scientific trends are developing. We have specialized in C-W radar.

Q. What would you say is the basic advantage of C-W radar?

A. The basic instrument is smaller, lighter, and more easily transportable.

Q. You also have a contract for navigational development with the Navy?

'Electronic helicopter hovering device'

A. Yes, but I can't say exactly what it is tied into. This is a navigational system in the broadest sense; tactical systems were involved developmentwise.

We did a great deal of work in the guidance field, and that has led us in two directions: one, in the direction of pilotless aircraft like the Firebee, and two, in separate contracts we now have for continuation of electronics guidance. The heart of a missile is the guidance system. In addition to this we have other guidance systems work for the Air Force and the guidance system of the Firebee is very much alive.

Q. Are you working with control systems, as such, from the standpoint of the automatic pilot?

A. Our autopilot applications are numerous. The nature of our projects requires us to do work in this field. Actually our activities include quite a segment of the now very broad aeronautical spectrum.

Q. Can you mention some applications toward which Ryan electronics research is pointed?

A. Ryan is working on the development of a self-contained airborne helicopter hovering device. This Electronics Division project is an outgrowth of work performed in the field of airborne navigation. In addition to helicopter hovering and navigation, these electronics devices may be devoted to other special tasks, such as photography and bombing.

Q. How many engineers do you have at Ryan?

A. About 524 of our 4000 employees are engineers. We doubled our engineering staff in the past year, indicating our shift into more prime contract work.

Q. You seem to have a very large stake in subcontracting. Will your expanded basic research work let you penetrate into the field of prime contracting to any great extent?

A. Well, we have already penetrated it quite a little ways, although our largest dollar and production volume is in subcontracting in the broad sense of the word. In many cases we build items that we design for the customers rather than the customer's designs.

Q. You did about $50 million worth of business last year. Could you give us some idea how that was divided between the different types of work that Ryan is doing?

A. I would say about $20 million for aircraft and components, $20 million for high temperature parts for jet, piston, and rocket engines, and $10 million for research, design, and development projects.

Q. There seems to be a growing tendency to withdraw subcontracts to boost prime contractors' activity. How are you affected?

A. We have not been affected because we are rather highly specialized. We have the kind of equipment and know-how that is of special value to the prime contractors. We have established a record for producing high quality products at low cost.

Quite a proportion of the jet engine is made of welded and precision machined sheet metal, requiring special facilities and special skills. We are uniquely equipped for this highly specialized work, and jet engine manufacturers look to us as a dependable and established source.

Q. What is your backlog?

A. It is around $50 million now, approximately the same that it has been for some time. That represents a year's backlog at the 1953 production level. Last year our production lots were a little longer and involved not quite so many different items. Our experimental department is just chock full of all sorts of things. We use our experimental department for small production runs as well as experimental models. The volume of work in that is very much higher than it was last year, but lots out of the shop are coming in smaller quantities.

Q. Excluding the Firebee, what are your thoughts in the field of complete airplanes, in which for a long time you had a very active stake?

A. We have contracts right now for over $7½ million, which we referred to in our annual report, for both piloted and unpiloted jet aircraft.

Q. Could you elaborate on the piloted aircraft involved in this backlog?

A. It is in the research and development category; it is not in production.

Q. Your firm had an experimental missile some years back called the Firebird. What happened to that? Might it evolve into a future missile?

A. That was a research project, which wasn't designed to be an operational missile. There were a lot of things learned from it that are being applied to certain parts of the Firebee and other projects.

Helicopter Study Group

Q. Do you have any interest in helicopters as such?

A. Very much so. We are keeping in close contact with the helicopter field. There is an awful lot to be done in some phases of helicopter development. It is a fruitful field for anyone who can contribute to their improvement and we hope to participate in that development.

Q. Do you have a helicopter group, as such, at Ryan?

A. We have specialists working exclusively on helicopters; but that doesn't mean we are building them.

Q. Are you also in the rocket motor field?

A. Ryan currently produces the complete rocket motor for the "Corporal"—Army Ordnance surface-to-surface vehicle, one of the most successful guided missiles now in production. The rocket motor was designed for this particular use by the jet propulsion laboratory of the California Institute of Technology, but Ryan has been the production source. Details of thrust and construction are still restricted.

Q. Have you contributed anything, as a company, to the metallurgical side of the rocket engine development?

A. We have a company-sponsored metallurgical research program in a field not so far covered by any agency in this country, so far as we know, covering a fairly wide range of high temperature alloys.

Q. May I ask what you feel the main problems in the industry are?

A. The major problem is simple: There is really a need for a continuous planned program of procurement. On a broad basis of national interest we all know that this steady procurement program is vital to the country.

I think that the aircraft industry feels moderately optimistic that there are signs that there will be less fluctuation for the next few years. The need is so great that surely they can't miss having a consistent policy of procurement. That's what we hope anyway. • • •

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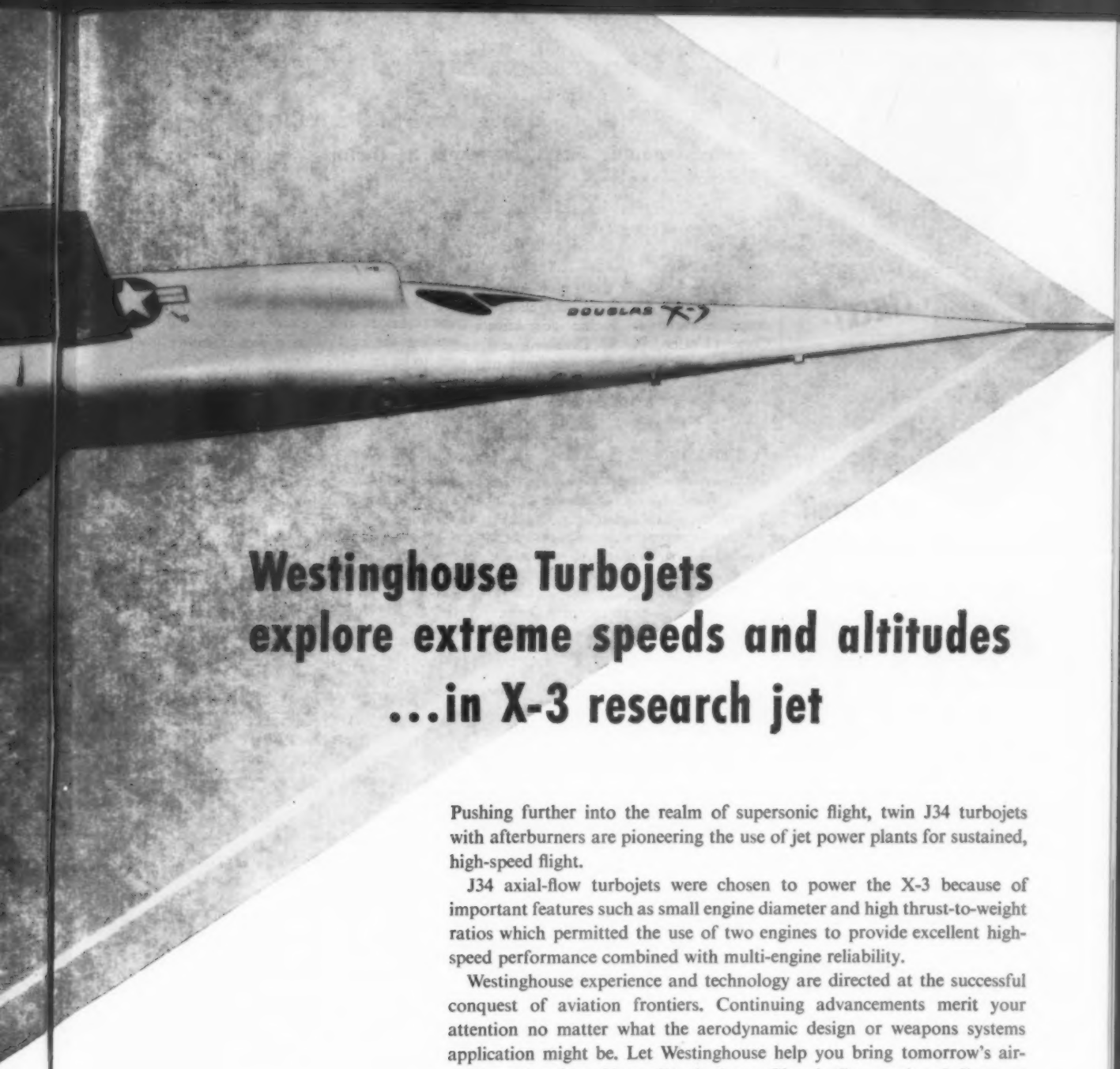
ENGINEERS AND BUILDERS OF OIL HYDRAULIC EQUIPMENT SINCE 1921

TOMORROW'S AIRCRAFT: *One step closer*



Westinghouse Turbojets explore extreme speeds and altitudes ...in X-3 research jet

Pushing further into the realm of supersonic flight, twin J34 turbojets with afterburners are pioneering the use of jet power plants for sustained, high-speed flight.

J34 axial-flow turbojets were chosen to power the X-3 because of important features such as small engine diameter and high thrust-to-weight ratios which permitted the use of two engines to provide excellent high-speed performance combined with multi-engine reliability.

Westinghouse experience and technology are directed at the successful conquest of aviation frontiers. Continuing advancements merit your attention no matter what the aerodynamic design or weapons systems application might be. Let Westinghouse help you bring tomorrow's aircraft . . . One Step Closer. Westinghouse Electric Corporation, 3 Gateway Center, P. O. Box 868, Pittsburgh 30, Pa. J-91018

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The JETCAL also has these corollary purposes:

A) To isolate errors in the EGT system.

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E) To separately test the EGT indicator using the potentiometer and special circuit of Jetcal

F) To functionally test overheat detectors and wing anti-ice systems (thermoswitches) by using TEMPCAL* Probes.

JETCAL Tester is guaranteed accurate to ±4°C. at engine test temperature.

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• The production or maintenance engineer, pilot and *cost accountant* will readily assay the safety and savings factors resulting from Jetcal use. *We invite inquiries concerning the Jetcal Tester . . . and will be glad to have our engineering department help solve your heat problems.*

*Available separately at extra cost.

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DC-3 Conversion Marks PAC Meeting

Switch to higher powered P&W R-2000 arouses interest among executive users at forum.

ALL SIGNS point to increased interest among executive aircraft operators in the conversion of Douglas DC-3 aircraft to the higher-powered Pratt & Whitney R-2000 engines.

This trend was very much in evidence recently as Pacific Airmotive Corp. (Linden, N. J., Division) and Pratt & Whitney Aircraft combined to sponsor the first of the 1954 P&W engine operation and maintenance forums to be held throughout the year.

Executive Representatives

Most significant feature of the PAC session, which brought attendance from over 75 representatives of executive aircraft owners, was the disclosure that two operators—Olin Industries, Inc., and Texas-Illinois Natural Gas Pipeline Co.— have each recently converted a DC-3 to R-2000 engines.

Within a matter of days following the PWA-PAC meeting, official CAA approval of its DC-3/R-2000 modification was announced by PAA. It authorizes the airplane to be operated at a new high gross weight of 26,900 lbs., with 1450 horsepower for take-off.

Final approved version of the modified DC-3 is rated for 750 hp cruise operation. Crusing speed, according to PAA, is 205 mph at 10,000 ft. altitude and full gross weight.

Engines approved for the installation are both the R-2000-D5 and the R-2000-2SD13G, the basic difference between the two being the single stage blower on the D5 and the high-low blower on the 2SD13G.

Data Made Available

PAA plans to make CAA approved engineering data covering the changes available to other airlines, fixed base operators, and executive operators at a reasonable fee to help write off engineering and flight testing costs incurred over the past two years. PAA got into the DC-3 alteration jointly with Pan American-Grace Airways back in 1952 with the aim of improving the performance of the airplane at critical high altitude airports on South American routes.

Also highlighting the PAC forum were talks by P&W representatives W. W. Doolittle, A. E. Hale, and J. E. McCormack pointing up these recent developments:

• **Mixed Spark Plugs:** Recent P&W tests on CB-16 engines showed a tendency toward pre-ignition during wet take-off operation which can be reduced or eliminated by use of a colder spark plug in the rear plug position of the front cylinder row. P&W is recommending the change in a service bulletin to be released soon.

• **Ground Power Checks:** Trend is toward use of engine checks at field barometric pressure rather than long standard 30″ Hg method for more reliable indication of engine operating condition. Procedure is to run engine up to a manifold pressure corresponding with the field manifold pressure and then check rpm reading. On the R-2000 engine it should be approximately 2000 rpm, and on the R1830, 2100 rpm.

Basic Advantage

Basic advantage of this type check, according to P&W, is that it will indicate spark plug out, conditions that might not otherwise be detected on a routine 30″ check.

• **Oil Screens:** Experience with newer disc or wafer type main oil screens now available for R-1830 engines and higher shows a 150% greater filtering capacity and longer allowable operating periods between screen checks. Advantage of this type screen, P&W says, is that it is not subject to collapsing and by-passing contaminated oil through the engine.

Mid-Periods

• **Valve Clearance Checks:** Although not considered necessary on R-1830 engines as a repetitive maintenance check, P&W recommends such an inspection at mid-periods for larger engines operated to 1000 hours and at 400 hour intervals on engines operated to 1200-1600 hour periods.

P&W also revealed work now being conducted with the Sperry Gyroscope Co. on the use of the Sperry Engine Analyzer for dynamic checking of valve clearances. Representatives indicated, however, that although general agreement had been reached between P&W and Sperry on the interpretation of most analyzer patterns, tests have not been finalized and are being continued.

• • •

Collins flies with Delta-C&S

One of the great airlines of the world, Delta-C&S ranks fifth in U. S. passenger mileage and spans the Caribbean — reaching out to six foreign countries. Delta-C&S service is characterized by smooth efficiency of operation. The modern Delta-C&S fleet of 20 Convair 340's, 6 Constellations, and 7 DC-6's (with 10 DC-7's scheduled for delivery early this year) is outfitted with Collins dual VHF communications and navigation equipment. Some of the Collins equipment in use: Collins 51V glideslope receivers — designed to ARINC specifications; Collins 51R-3 airborne receivers — providing for Omni, ILS, and VHF communications; the new Collins 180L-2 automatic antenna tuning unit for use with the 18S-4, 10 channel, 20 frequency transceivers — with 100 watt output in the frequency range of 2.0 to 18.5 mc. *Needless to say, Collins takes pride in flying with Delta-C&S.*

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TRANS WORLD AIRLINES

Industry Hostile to ACC Recommendations

Eisenhower adopts report as aviation policy; sections on subsidies and mergers expected to draw fire.

By Eric Bramley

TWO controversial sections of President Eisenhower's civil air policy statement, released May 26, will find little support among the various segments of the air transport industry, and implementation of some of the policies seems remote at this time.

These two sections, covering subsidies and routes, recommend a timetable for "orderly" reduction or withdrawal of domestic airline subsidies, mergers of trunklines into a more limited number of systems capable of carrying their fair shares of uneconomical and developmental services, and elimination of uneconomic competitive services.

In addition to lack of agreement in industry, vigorous dissents by the two Democratic members of the Civil Aeronautics Board, Joseph P. Adams and Josh Lee, principally over treatment of local service lines, are expected to be made public soon.

The 83-page document, representing seven months' work by the Air Coordinating Committee in cooperation with government and industry groups, becomes the Administration's official statement of aviation policy. The President said he will use it "as a guide in the future consideration of questions related to the subject of civil aviation and in making appropriate recommendations to Congress."

ACC, he said, had accomplished its task "in a fashion that could make its report a milestone in the progress of American aviation. The report . . . reflects this Administration's central objective—to strengthen American aviation."

However, objections will come from industry on the subsidy and route issues. Larger carriers stand to be saddled with uneconomic services; smaller trunks face the possibility that government may decide their only salvation is merger with bigger systems; local service lines must meet rigid standards.

There was a feeling that the underlying problems connected with the new policies were not fully enough explored. In addition, the report was silent on who is to implement such items as subsidy timetables, etc., and when it is to be done.

As to other sections of the report, some observers emphasized that it was highly desirable to have many of the subjects stated as Presidential policy, although they are not new.

The majority of the report deals with air transport; the only manufacturing topics discussed are those having a "substantial civil aviation interest." Military questions were referred to the Department of Defense.

Significant in the manufacturing section is a recommendation that the federal government should, "by appropriate means, provide financial aid for the development and testing of a local service prototype." This was not a unanimous recommendation of ACC; it was not favored at the ACC working group level, and was evidently added by the top Committee.

Following are principal air transport recommendations in the report:

• **Subsidy:** Schedules should "immediately be established for the orderly reduction, and withdrawal where appropriate, of domestic air carrier subsidy support." Subsidy should, as far as possible, "be limited to strictly temporary aid . . ." Foreign competition and other factors will probably prolong the period during which international subsidy will be required.

Limits to Subsidies

Existence of a route certificate should not in itself obligate the government "to continue subsidizing a service, if it is determined that the cost has become disproportionate to the public benefits." In the future, government's maximum subsidy commitment for any new or renewed route should be limited, as to amount and duration, at the time the route authorization is granted. If a carrier should find it impossible to provide the service within its authorized subsidy, it would seek reconsideration of its route certificate.

Where public interest requires continued maintenance of uneconomical services, "increased emphasis should be placed upon the inclusion of such operations within route systems . . . capable of absorbing their cost without subsidy." When any carrier or group of carriers achieves the basic capability for sustained self-sufficiency, it should be removed "from the protection of subsidy eligibility."

• **Routes:** Plans should be developed for consolidation of trunklines into a more limited number of systems, capable of self-sufficient operations while carrying their fair shares of uneconomical and developmental services. Operation of uneconomic competitive services should be avoided or eliminated.

"The route structures and certificates of the . . . local service carriers should be adjusted to provide the maximum opportunity to improve their economic position . . . Where continued and significant progress toward self-sufficiency is not demonstrated . . . operating authority should be terminated in an orderly fashion. To the extent that the services formerly provided . . . are clearly required to meet a public need, such services should be furnished by another carrier capable of providing the services without cost or at lower cost to the government. The program of route adjustments should be expedited in the light of the schedule to be established for an orderly phased reduction and eventual elimination of subsidy support for the local . . . carriers."

Air route pattern development must take into consideration advantages represented by continued technological progress in the field of aircraft design and performance.

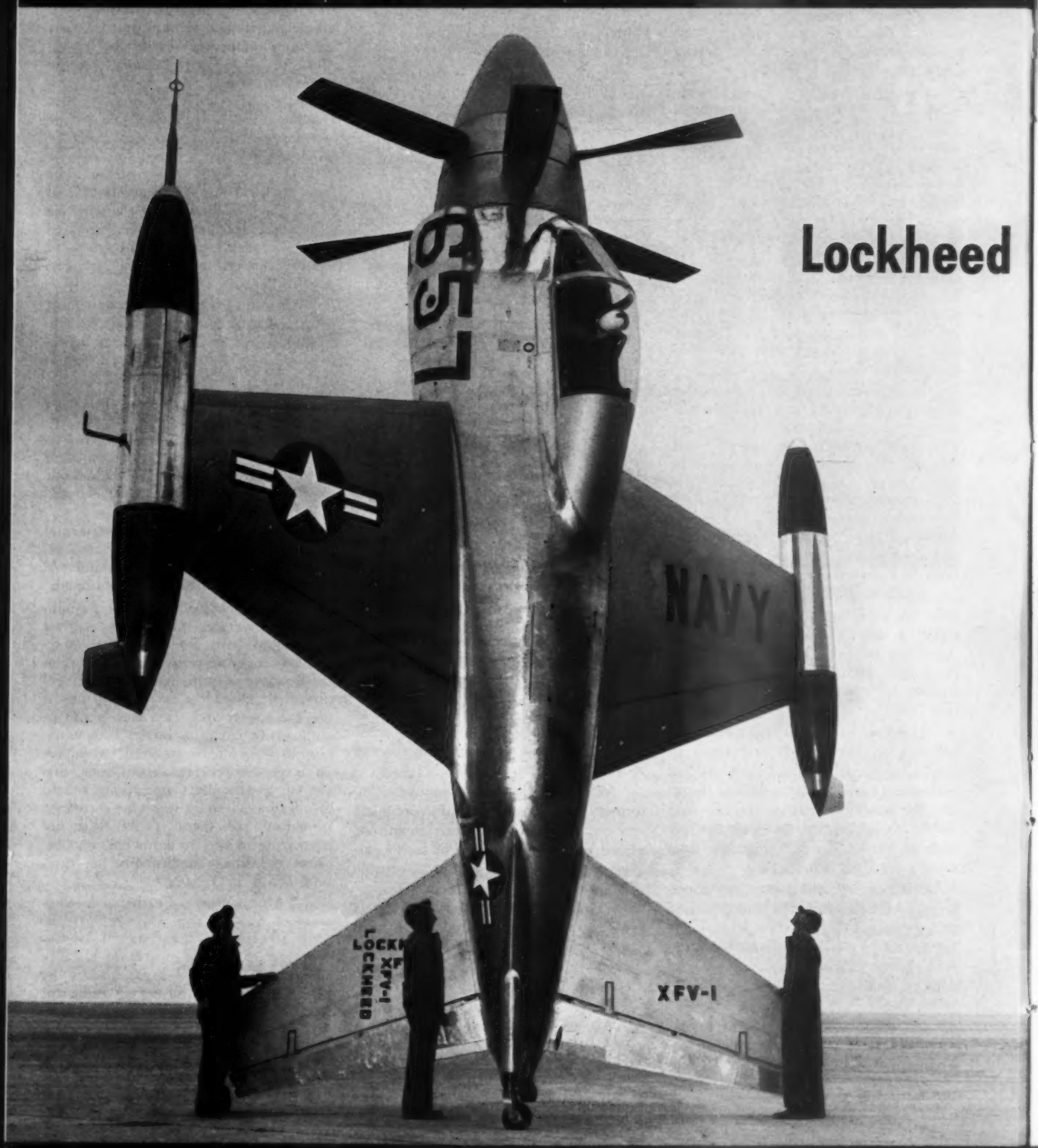
National interest requires that many international routes be maintained, despite subsidy. "Route decisions in this area should recognize the necessity of avoiding or eliminating uneconomic duplication of service between United States carriers."

A limited subsidized experimental program for developing operational experience in provision of commercial helicopter services should be continued.

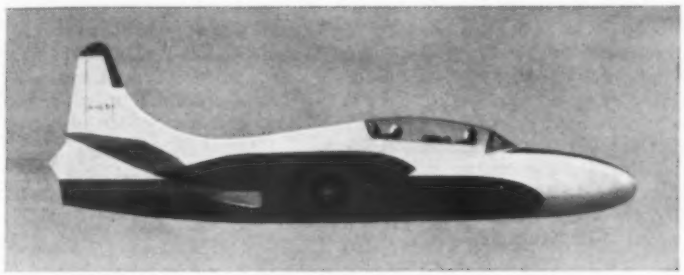
• **Non-Scheduled:** Concept of nonscheduled services does not provide a meaningful basis for exempting route-type passenger services from the normal certification requirement. In the future, there should be no "general use of the exemption authority as a basis for authorizing common carrier transportation to individually ticketed passengers on large transport planes." Bona fide charter and contract operations should be encouraged and a new-type certificate developed for them. (CAB did not participate in this recommendation "because of direct applicability to cases now before it.")

• **Air Cargo:** Further development of the air cargo industry, particularly all-cargo services, should be encouraged. A greater degree of stability should be given all-cargo carriers by granting them certificates of sufficient duration to enable them to obtain adequate financing. Military and civil agencies should cooperate early in the development cycle of all new all-cargo

SPECIAL CRADLE LIFTS XFV-1 from prone position (for servicing) to upright for vertical takeoff.



LEADERSHIP DEMANDS CONSTANT ACHIEVEMENT



WORLD'S SAFEST JET AIRPLANE. Greater power, larger cockpit, but, above all, more safety have been engineered by Lockheed into its new jet trainer. New stall slats, drag chute, Zero Reader and pilot "stick shaker" device to automatically warn about possible stall are just a few of added safety features. Trainer combines jet combat performance with maximum operational safety. Easier to fly than simple propeller-driven trainers.

GUIDED MISSILE and pilotless aircraft research is advancing rapidly at Lockheed. Here engineer-scientists from the Missile Systems Division test top-secret developments to meet problem of supersonic speeds yet unattained.

Scientists Unveil Radical Forms of Flight

High-Speed Navy Fighter Takes Off Straight Up, Lands by Backing Straight Down on Its Tail

Today's biggest news in aviation is the Navy's XFV-1 built by Lockheed, a revolutionary new vertical-rising plane.

A powerful Allison turbo-prop engine with two jet turbines turning counter-rotating propellers lifts XFV-1 straight up, rocket fashion. It levels off for speeds in the 500-m.p.h. class, lands on its tail.

Many Lockheed "firsts" are built into this airplane. A ¼-scale model powered by a 76-h.p. electric motor was built and flown to test vertical ascent, transition into level flight, and landing. Careful weight control permitted completion of first prototype hundreds of pounds less than estimated weight for Navy requirements.

Unique 4-way tail serves as a single surface and jointly functions as elevator, aileron and rudder, using revolutionary interlocking controls.

SOUND ENGINEERING pays off with Lockheed P2V Navy patrol bomber. The famous Neptune has increased gross takeoff weight and boosted speed by adding powerful jet pods. Neptune's aerodynamic configuration, however, remains unchanged from original X model 11 years ago through the current 7 series.

FIRST ROUND-THE-CLOCK flying radar station in the world is this Lockheed Early Warning Aircraft (designated WV-2 by Navy and RC-121C by Air Force). Huge 600-gallon tip-tanks extend radar-laden Super Constellation's range. Plane carries more scientific equipment than any other known aircraft—some six tons of electronics. Bottom radome, the size of a swimming pool, is largest plastic part ever built. Although it is held to plane by only 10 bolts (no metal ribs), radome is built to withstand aerodynamic pull of up to 60,000 pounds. Super Constellation's three-tail design insures aircraft controllability despite air-flow disturbance created by protruding radomes.

Lockheed

California Division—Burbank, California
Georgia Division—Marietta, Georgia
Missile Systems Division—Van Nuys, California
Lockheed Aircraft Service—Burbank, California
Lockheed Air Terminal—Burbank, California

LOOK TO LOCKHEED
FOR LEADERSHIP

NEW FLIGHT FORMS are studied by Lockheed scientists to meet sonic and thermal problems of ultra-high speed, higher altitudes. Nearly a decade of research on wing shapes alone results in new Lockheed forms in Mach 2 to Mach 3 range. Lockheed has tested almost 100 distinctly different wing models on supersonic rockets.

planes, in order to produce aircraft responsive as nearly as possible to both civil and military requirements. (CAB did not participate in these recommendations.)

• **Air Mail:** All subsidy must be excluded from service mail pay. Service rates should be established on principles of fair and reasonable compensation for the services performed "which will take account of all pertinent factors and recognizing any differences in cost or character of service, will bear a proper relationship to the charges existing for other forms of traffic."

U. S. will continue to forward mail on both U. S. and foreign airlines. Any difference between Universal Postal Union rates and rates paid U. S. lines should be handled as an internal matter within the U. S. government in accordance with applicable laws and Reorganization Plan 10.

• **International Aviation:** Exchange of transport rights will continue by bilateral agreement until a multilateral agreement is achieved which contains principles generally in accord with those of existing U. S. bilaterals. U. S. will negotiate on basis of Five Freedoms and will adhere to Bermuda principles as the most satisfactory basis for relating capacity to traffic. In determining routes in bilaterals, U. S. will continue its objective of establishing, insofar as possible, an equitable exchange of economic benefits.

IATA will be given full U. S. support as the primary instrument for establishing and maintaining sound fare and rate structures. CAB should be empowered by Congress to control fares, rates, rules and practices of U. S. international lines as it does domestic lines, and to control fares, etc., of foreign lines more effectively than is now possible.

U. S. continues to support ICAO but urges fewer Council meetings and a reduction of workload "with consequent budgetary economies."

• **Airports:** Federal aid will be concentrated on "national interest" airports; law should be amended to allow more flexible use of federal money. Such funds will be used for runways, lighting, etc., as opposed to terminal buildings.

• **Airways:** Continuing policy will be to provide for a single national common civil-military system of air navigation and air traffic control to satisfy all requirements "except for those special military requirements peculiar to air warfare." An accelerated civil-military research and development program in this field is urged.

• **User Charges:** Consideration should be given to an airways user charge program, but it should be part of a government policy to charge for all federally provided transport facilities.

• **Airspace Control:** Federal regulations on minimum flight altitudes should be re-examined to determine whether revision is needed to dispel any possible inference that the government "has not exercised its regulatory jurisdiction over the entire flight of an aircraft in the airspace above the United States navigable in fact."

Observers attach considerable importance to this policy in view of pending court cases in which cities are seeking to prohibit flights under a certain altitude. Most important is the Cedarhurst case, which affects New York International Airport.

Government power to control erection of structures within airspace for the purpose of controlling and protecting air navigation should be strengthened by legislation.

• **Aircraft Noise:** Government should continue efforts to minimize landing and take-off noise and should participate in any litigation so that the courts "may be fully advised on the governmental nature of this problem."

Ends, Not Means

• **Safety:** Government should continue trend toward (1) safety rules prescribing the particular objective sought rather than the means by which it is attained, and (2) curtailment of supplementary directives of a mandatory nature. Airlines, manufacturers and other industry organizations must assume primary responsibility for assuring adherence to safety standards within their organizations.

Policy of using designees not on the federal payroll to perform the great bulk of examining, certifications and inspection work with respect to individual aircraft and airmen shall be continued.

• **Aviation Mobilization:** "Transport airpower has gained such importance as a factor in U. S. defense capabilities that it is essential to winning a modern war . . . An industry growing on an economically sound basis provides the most effective way of achieving a high level of readiness without excessive cost.

"For long-range mobilization planning purposes there is on open end requirement for expansion of transport airpower limited only by (1) what the taxpayers can afford for military transport capabilities in being, and (2) sound promotional policies for civil transport capabilities."

There must be balance between civil airlift capacity allocated to Civil Reserve Air Fleet and to the war air service pattern of commercial air transport essential to the war effort. Balance should be preserved by allocation of all resources in short supply, such as skilled manpower, maintenance facilities, spare parts, etc. More detailed civil aviation manpower mobilization plans than now exist shall be developed immediately.

Civil air transport services supporting military operations shall be employed in wartime as commercial entities; militarization should be undertaken only in cases clearly essential to the national interest and should be accomplished only by executive order of the President.

Single worldwide air priorities system should be maintained on a standby basis for wartime use, with joint civil-military policy determination.

Aircraft overhaul and maintenance phase of Defense Department's logistic system will be based on a combination of Defense Department and commercial resources.

In the manufacturing section of the President's statement, several items that were contained in ACC working group drafts were deleted. These dealt with profit margins, accelerated amortization, production financing, and patent and proprietary rights.

Most important manufacturing recommendations, in addition to federal aid for development of a local service prototype, are:

• **Aeronautical Research:** The U.S. should continue its support of research and development in all important phases of civil aviation. Facilities to conduct this R&D should be kept modern and expanded where necessary. Research data paid for by the U. S. should be widely disseminated to stimulate competition.

• **Personal and Utility Planes:** Responsibility for their development should remain with the aircraft industry, but the U. S. should continue to provide support to basic research on elements needed to accelerate development of more advanced types. The Government will continue to make the regulations applying to airworthiness and operation of small planes as simple as possible.

• **Civil Transports:** While the industry should continue to remain responsible for their development, the U. S. should underwrite simulated airline operations before the new planes are introduced into service. All such planes, fixed wing or rotary, except those specifically for military use, should meet civil airworthiness standards. These aircraft should be built so that essential military equipment can be easily installed. And there should be closer coordination between military and civil agencies on designing, testing, and approving new transports, including cross-representation of military and civil certification boards. • • •

NORTH AMERICAN HAS BUILT MORE AIRPLANES THAN ANY OTHER COMPANY IN THE WORLD

salty vets and sleek new jets

These North American airplanes help the Navy in its vigilant defense of the seas.

SNJ Trainer — Navy version of one of the most venerable and dependable of all training planes ... the world famous T-6. Served with 33 Allied nations during WW II, gave effective tactical ground support in Korea. Thousands still in active service.

AJ-1 Savage — Holder of many Navy "firsts" ... the AJ-1 Attack Bomber was the first Navy plane designed to carry the A-Bomb ... and first plane of its size to land on a "flat top." Weighing in at 15 tons, unloaded, the Savage is powered by 1 jet and 2 reciprocating engines and carries a crew of 3.

AJ-2P — The photo reconnaisance version of the AJ-2 ... first cousin to the historic AJ-1. Carrying no guns, but fitted with 18 cameras ... the "2P" can fly high or low, can take pictures at any time ... day or night ... with special photoflash equipment in its bomb bay.

FJ-2 Fury — Now operational with the Marine Corps, this Fury set new records by completing rigid carrier evaluation tests in record time. With a speed of over 650 MPH and carrying four 20 mm cannons, the FJ-2 has a range of about 1000 miles and a service ceiling of over 45,000 feet.

T-28B — Faster than many WW II fighters, this new trainer has a top speed of 343 MPH and a service ceiling of 35,500 feet. Now being supplied to both Air Force and Navy training programs, the T-28 was designed for utmost efficiency in training our new pilots ... incorporating many innovations.

FJ-3 Fury — One of the U. S. Navy's newest air superiority fighters ... with speed in the high mach numbers, faster rate of climb and superior firepower. Latest in North American's FJ Series of carrier-based planes, the FJ-3 will soon be assigned to fleet duty.

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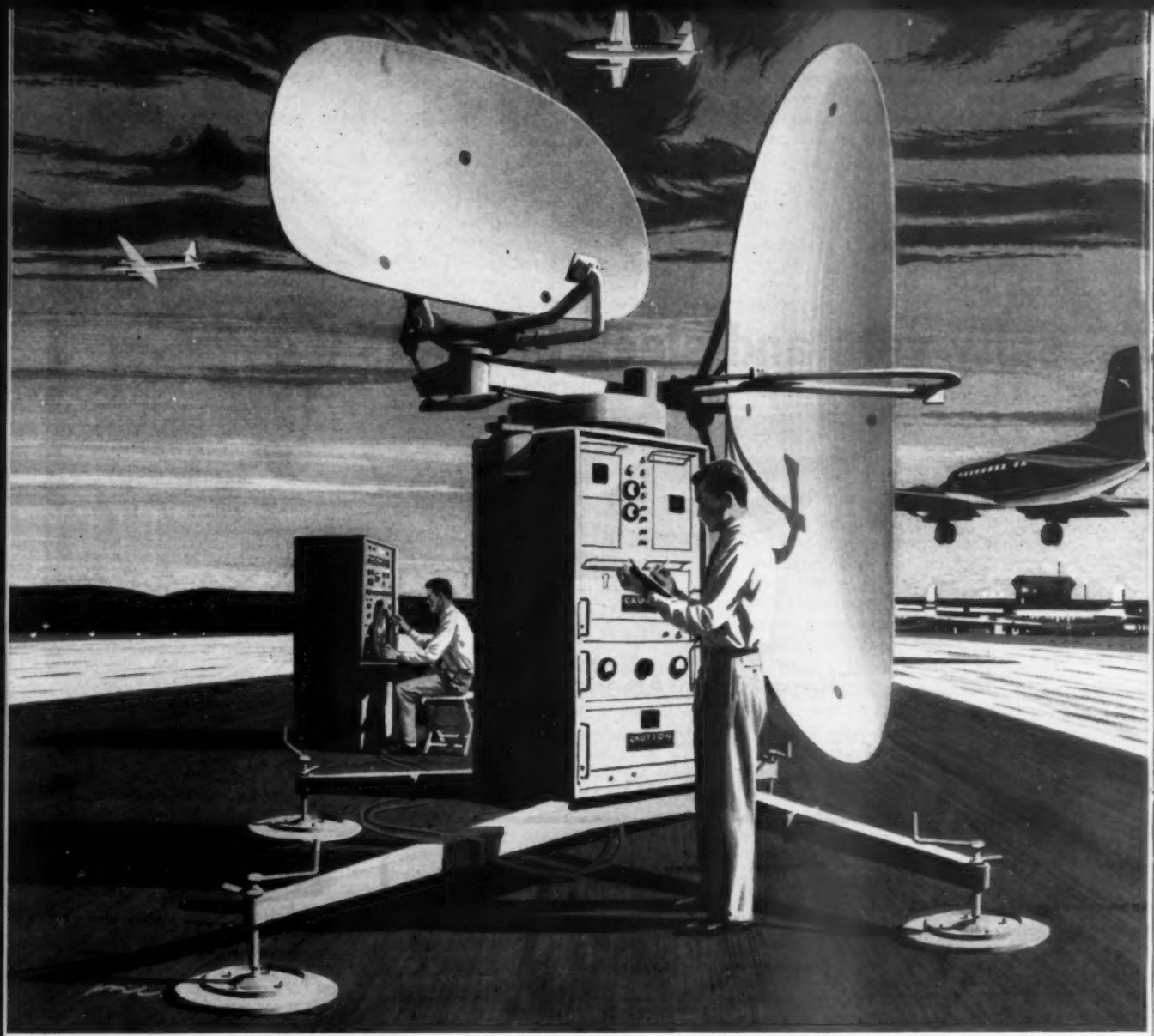


Gilfillan Announces World's First 4-in-1 Radar

New Gilfillan GCA Quadradar provides Surveillance, Final Approach, Height-Finding and Airport Taxi—four radar functions in a simple one-scope equipment weighing less than 1800 pounds.

For the first time, the complete answer to radar traffic control in one light-weight low-cost equipment—the new Gilfillan GCA Quadradar.

One scope provides four radar functions at the turn of a switch—surveillance, final approach, height-finding, airport taxi control.

Superior to all previous GCA radars in altitude, azimuth and range coverage. The full 30° scan of both azimuth and elevation beams is displayed on the new Gilfillan Beta Scan Azel indicator—and the final approach range extended to 20 miles. The new Beta Azel display combined with height-finding to 50,000 feet in a 20-mile slant range provides advantages never before possible with one equipment.

ONE SCOPE

4 Radar Functions at the Turn of a Switch

1. Surveillance: Sharp presentation of smallest aircraft in 20-mile radius to 10,000 feet, large aircraft in 40-mile radius.

2. Final Approach: New Beta Azel Scope gives precision display in 20-mile sector with 30° azimuth-elevation beam.

3. Height Finding: Accurate altitude information to 50,000 feet at 20 miles.

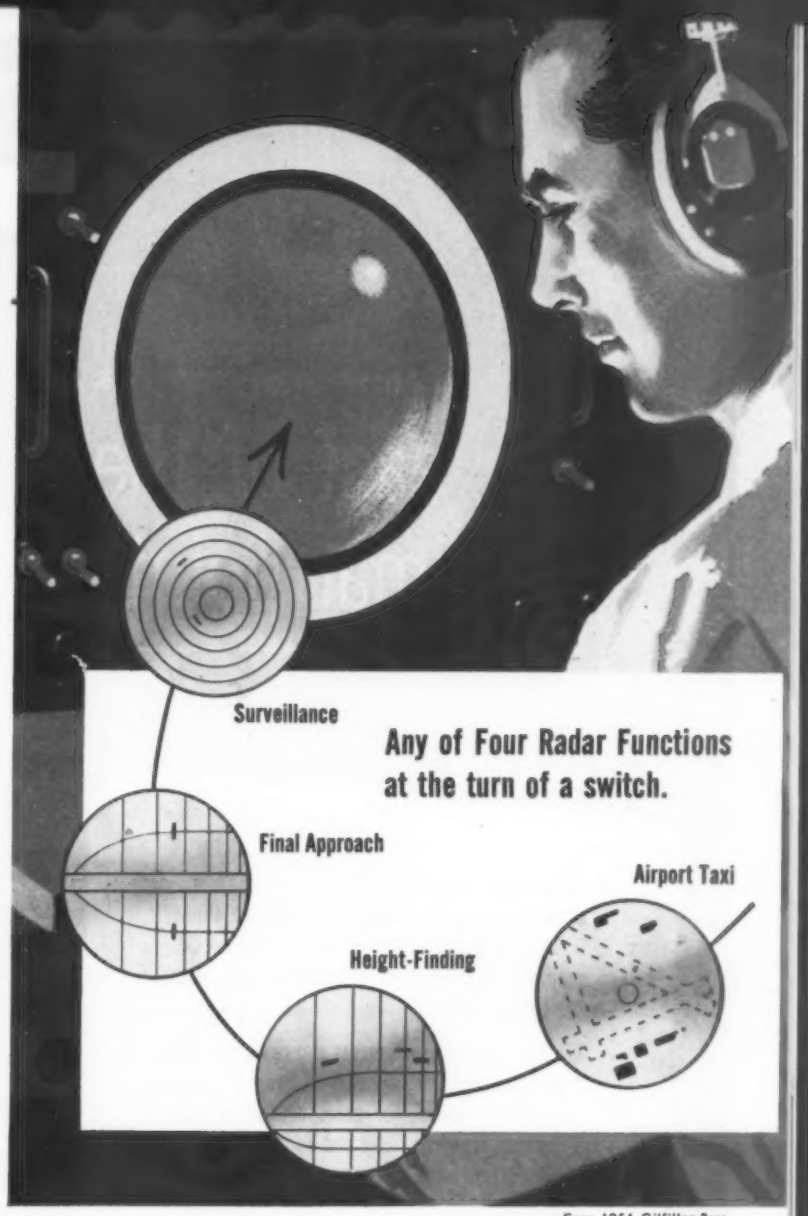
4. Airport Taxi: Needle-sharp presentation of runways, taxiing aircraft, field obstructions.

TACTICAL ADVANTAGES

The new Gilfillan GCA Quadradar weighs less than 1800 pounds, is 12 feet high. Air-transportable by cargo plane or helicopter. Assembles for operation within 3 hours; 50-60 cycle operation; weather-protected; remotable up to 10,000 feet. For the first time, complete, efficient radar control is available for advanced emergency airstrips.

WRITE FOR BROCHURE:
SPECIFY:
Gilfillan GCA Quadradar-M (Military Equipment)
Gilfillan GCA Quadradar-C (Civil Airport)

Complete specifications and detailed advantages in brochure available now. Includes information on simple maintenance, proven components, ease of integrating training. Address Gilfillan Bros., Dept. AA-6, 1815 Venice Blvd., Los Angeles, Calif.



Copr. 1954, Gilfillan Bros.

MULTIPLE RUNWAY COVERAGE

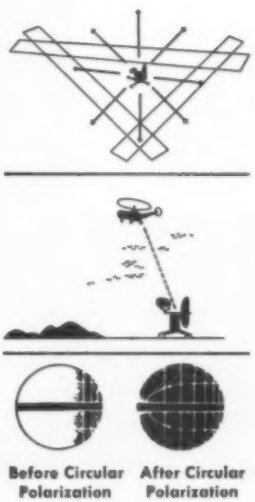
Located near the junction of two or more runways, the Gilfillan GCA Quadradar provides multiple runway coverage without relocating equipment and without expensive turntables. Antennas rotate electrically through 360°, can be set to align instantly with desired runway.

SAFE HELICOPTER LANDINGS

With 30° scan, new Gilfillan GCA Quadradar handles steep-angle helicopter approaches from any direction.

CLEAR, CLUTTER-FREE DISPLAY

X-band throughout, Gilfillan's GCA Quadradar scope presents sharp display. Built-in circular polarization eliminates rain or snow clutter.



Before Circular Polarization — After Circular Polarization

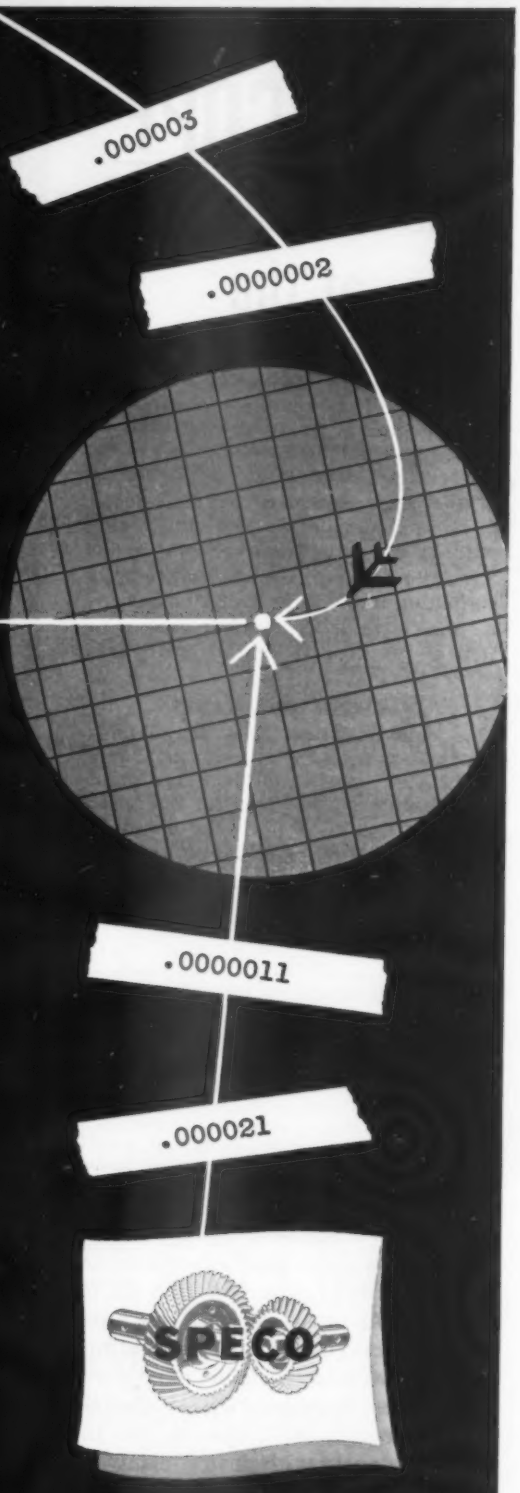
PROVEN EQUIPMENT

It should be emphasized that the new Gilfillan GCA Quadradar is proven practical equipment based on more than 12 years of Gilfillan concentrated experience and research in GCA radar. The Gilfillan GCA Quadradar is composed of Gilfillan-developed components of known dependability, proven in world-wide service and found reliable under the most adverse conditions — plus improvements and refinements based on the experience of 200 Gilfillan field engineers around the world.

Gilfillan **Los Angeles**

How many places

east of the decimal point?



● We haven't yet found this on a drawing but... on a bombing or computing gunsight, an almost infinitesimal decimal error in the device itself, may well be multiplied to hundreds of yards, at the target area.

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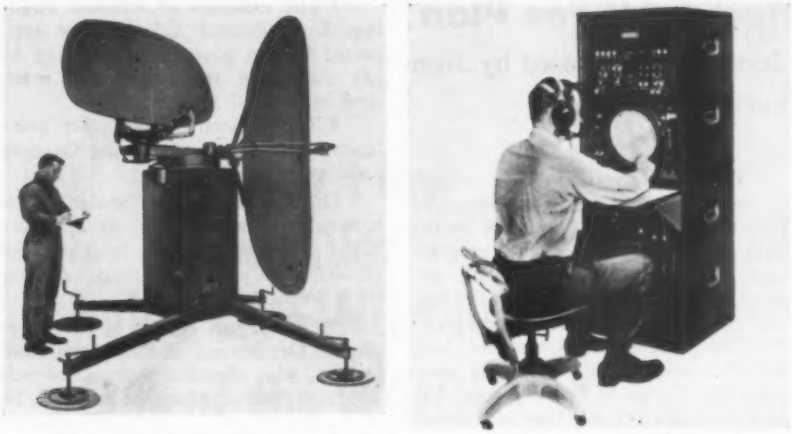

MAJOR COMPONENTS of new Gilfillan radar shown here are transmitter-receiver at left and indicator, right. Combined weight is 1800 pounds, and cost, $37,500.

Four-Way Radar Developed by Gilfillan

New unit handles four functions in compact, low-cost package; can be moved by helicopter.

GILFILLAN BROS. INC., of Los Angeles, Calif. has chalked up another first in radar development.

Producer of the airport surveillance and precision approach radars that have long formed the backbone of low visibility air traffic control operations at key U.S. airports, Gilfillan has now announced its new GCA-C Quadradar. It offers the combined services of airport surveillance and precision approach radars, and adds to these two other features—radar height finding and airport taxi control—all in a single, compact package.

As a highly accurate yet low cost unit, the new Gilfillan GCA-C will serve as a single all-weather traffic control and landing aid for small and intermediate airports where traffic wouldn't otherwise justify expensive ASR and PAR installations.

Paralleling this basic commercial application, the extreme light weight of the Quadradar permits it to be transported by helicopter, making it equally attractive for all-weather tactical operations at advance military airstrips.

Main features:

• **Low Cost:** Complete four-in-one package sells for only $37,500. Past GCA radar traffic control equipments have involved expenditures as high as $500,000, more than 10 times that of GCA-C.

• **Light Weight:** Quadradar weighs 1800 pounds complete. This represents only 4% of the weight of original Gilfillan GCA equipment built in 1944, which weighed 22 tons.

• **Early Availability:** New unit will be in quantity production within 10 months.

Basically, the new GCA-C is an X-Band radar presenting all data on a single 12-inch diameter scope. Merely by turning a switch the operator can select any one of the four radar functions: airport surveillance, precision approach, height finding, or airport taxi control.

Operational performance calls for:

Airport surveillance: Range of the GCA-C extends from about 20 miles for smaller aircraft up to 40 miles for large airline transports. Ranges of 5, 10, 20, and 40 miles can be selected.

Precision Approach: The Beta Scan type of Azel scope used by Gilfillan in the Quadradar displays the approaching airplane in three dimensions, showing altitude, azimuth, and exact range of the aircraft related to its final approach path.

Height Finder: Will display altitude information on aircraft within a 20-mile radius of the airport and up to 50,000 feet. For this function the GCA-C again uses the Beta Scan display and the operator can expand the elevation from the usual —1° to +6° setting to angle of —1° to +30°.

Main advantage of this feature is that it allows sighting of aircraft at high approach altitudes so that they can be directed into the airport traffic pattern at a very early stage. However, it is equally valuable for determining that the altitude of a particular aircraft does not present a collision hazard to other aircraft in the control pattern.

Airport Taxi Control: For high density airport ground operations, or for actual traffic direction during heavy ground fog conditions, the Quadradar uses a short sweep range with the display operated as a Plan Position Indicator (PPI) scope. It shows a plan view of runways and airplane traffic in much the same manner as Airport Surface Detection Radar (ASDE), which was originally developed for the U.S.A.F. by Gilfillan and most recently tested at New York International Airport.

One of the more significant design features in the GCA-C is the provision for multiple runway coverage of up to six runway approaches without relocation of the equipment and without the need for expensive turntables.

This is accomplished by first strategically locating the unit near the intersecting point of two or more runways, where it can land planes from either direction on each runway without changing position. Then if it is desirable to use a different runway, the antennas can be rotated, by means of a control at the operator's position, until they align with the new runway.

For wider coverage, the sector scan angle of both the elevation and azimuth beams has been increased to 30°, compared to the conventional 7° elevation and 20° azimuth scan of conventional PAR's. This allows the GCA-C to be installed between parallel runways up to 3000 feet apart and still give complete coverage for both runways. As an added feature, the radar operator's position can be removed up to 10,000 feet from the actual transmitter-receiver installation.

A major problem with all previous radars, that of rain and snow clutter during already critical instrument flying conditions, is also protected against in the GCA-C. To reduce this type of interference both antennas will be delivered with circular polarization grids at the option of the operator.

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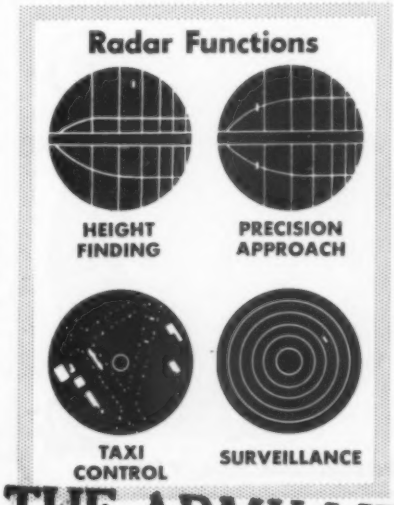

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Airport Operators Reject CAB Fee Plan

Favored treatment for local lines, proposed by Josh Lee, is turned down; CAB authority challenged.

By Lois C. Philmus

LOUISVILLE, Ky.—The American Association of Airport Executives has taken the CAB to task for "meddling" in airport affairs. In a resolution passed at its recent annual meeting, the group stated that CAB is a quasi-judicial body and has no authority to make recommendations on airport operations.

The blast was brought on by a CAB proposal presented to the convention by Member Josh Lee. Lee asked for "favored treatment" for local service carriers at the airports.

He cited the formula set forth by the Conference of Local Airlines as being "reasonable." The formula called for a landing fee schedule of 2% of gross generated passenger revenues at intermediate points and "no more than 8¢ per thousand pounds" of aircraft gross weight at major terminals.

Lee went further than the Conference in suggesting a formula for airport terminal rentals as follows: $1 per square foot at airports served by local airlines exclusively and $1 flat charge plus an additional 25¢ for each trunkline at other fields.

The AAAE voted to have no part in such a program. The estimated $500,000 which would be saved by the local service airlines if the program were completely adopted by all airports involved was hardly worthwhile, according to the airport managers.

The consensus was that the local service experiment was Federally sponsored and should be Federally operated. Airport authorities feel they are already subsidizing the airlines, as well as surrounding communities, and have no wish to assume an even larger burden. They also stated that the program as described would constitute preferential treatment for the local carriers over the trunks, and in many cases, contracts would prohibit such a step.

Another major resolution passed by the convention concerned the proposed amendments to the Federal Airport Act. The AAAE agreed to support the amendments only if the following conditions were observed:

• **The 50% discretionary fund** would be labeled as a temporary move, to last no more than one year.

• **The exclusion of terminal buildings** from Federal aid must be supported by the government agreeing to pay the going rental rates for space used by Federal agencies.

• **The Federal Airport Act must** be completely rewritten during the next fiscal year.

During the three-day session at the Kentucky Hotel, the airport operators heard speakers on all major phases of problems facing the group. Among them were:

• **Dr. August Raspet** of the Aerophysics Department of Mississippi State College, who offered a paper on boundary layer control, which he feels can be the answer to airplane noise problems. A boundary-layer-controlled aircraft, he stated, employs less power and provides sufficient lift. A commercial transport with boundary layer control would find not only the noise factor alleviated, but greater power economy resulting. Besides being an answer to the noise problem, use of boundary layer control could also cut down on the growing need for longer and longer runways. The reason, Raspet pointed out, is that the higher lift achieved cuts down on braking and take-off run.

• **Col. Leslie P. Arnold** of Eastern Air Lines told the group that the interdependence between carriers and airports will grow as time progresses. With the airlines facing their most critical period, Arnold feels that the airports should work with the airlines in attracting more millions of people to air travel. Base of primary passengers must be increased from its present 4.5 million to 8 to 10 million by 1960 to provide sound economic footing.

• **Barton Hewitt,** a TWA pilot, recommended that future airports be built farther away from municipal airports and have multiple and parallel runways. He feels that building a single-runway airport in the hopes that future increases in airline traffic would finance construction of a second runway is a waste of time. Airlines can only make full use of airports with parallel runways. He also called for a system of taxiway patterns, recommending that taxi strips be located at 500-foot intervals along runways.

New officers elected for the coming year: William G. Fuller of Fort Worth succeeds Francis I. ("Jack") Bolton as president, with Robert Schmidt of Tucson taking over as executive secretary from Walter Betsworth of Waterloo, Ia. W. M. Post, Jr., of Allentown, Pa., is the new treasurer, with John Casey of Chicago and Henry Julliard as vice presidents. New directors include Fred Alley of Charleston, W. Va., and Ed Petro of Wilmington.

• • •

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...and ups its output 5-fold, too!

Not so long ago it took a lumbering giant of a machine to start Boeing B-52's. The starter weighed 12,000 pounds, yet for this application provided only a skimpy 57 air horse power.

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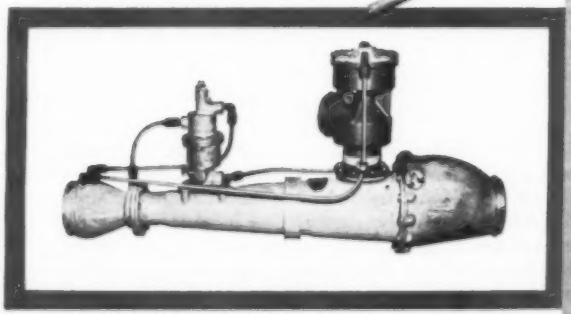
This unit is used with a ground air supply system to limit the compressor flow in the event demand falls below a specified minimum. A wide variety of performance curves can be produced with this basic design to match the characteristics of the air supply compressor.



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Evenly diffused lighting with no shadow or glare is a feature of this new concept for illuminating airline ticket offices. A development of Luminous Ceilings, Inc. of 2500 W. North Ave, Chicago, Ill. the design uses slim-line fluorescent light fixtures supplemented with corrugated vinyl plastic sheeting spread out on runners below.

PHOTO CREDITS

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West Coast Talk

By Fred S. Hunter

LEONARD SCHWARTZ, commercial sales director for Lockheed, read out a list of Super Constellation purchasers at a recent Lockheed Management Club meeting. Included was a new name, that of **Jorge Pasquel** of Mexico. This was the first disclosure that Lockheed had sold a Super Connie to the man who gained considerable prominence a few years back by hiring big league baseball players away from teams in this country to play in the Mexican league. But Pasquel isn't taking delivery on the Super Connie. The plane is being re-sold to Cubana. If it had jelled, the Pasquel deal would have meant much to Lockheed. It included an option on seven more Super Constellations intended for the round-the-world flag carrier envisioned by **Miguel Aleman,** former president of Mexico, and a group of associates, including Pasquel, when they bought LAMSA from United Air Lines and picked up control of Aeronavesa and Reforma. Eight Super Constellations carrying the Mexican flag on the international trade routes around the world would have added tremendously to Lockheed's standing and prestige, especially in the Latin countries. But **Adolfo Ruiz Cortines,** the new president of Mexico, lacked Aleman's enthusiasm for the ambitious venture. He declined to give it government support. The proposed international Mexican flag carrier fell by the wayside.

•

There's no doubt Douglas has a speculative eye cocked toward the possibility of turning out a lightweight DC-6. But whether or no probably depends upon Pratt & Whitney. An improved R-2800 engine, which would produce 1400 or 1500 hp for cruise, would make a hotrod out of a lightweight DC-6, and undoubtedly put Douglas in business. So far, however, there has been no word from P & W on any plans to step up the cruise power of its engine. Most of the weight-saving in a lightweight DC-6 would be accomplished by removing the bladder tanks and reducing the fuel capacity to 2400 gallons.

•

Performance of Northrop stock has well justified **Dick Rheem's** investment. The president of Rheem Manufacturing bought into Northrop when the stock was selling for $15 a share. It's now $27 (or was when this was written). Rheem holds 46,000 shares of Northrop, almost 9%. Holdings of **Floyd Odlum's** Atlas Corp. are reported to total about 50,000 shares.

•

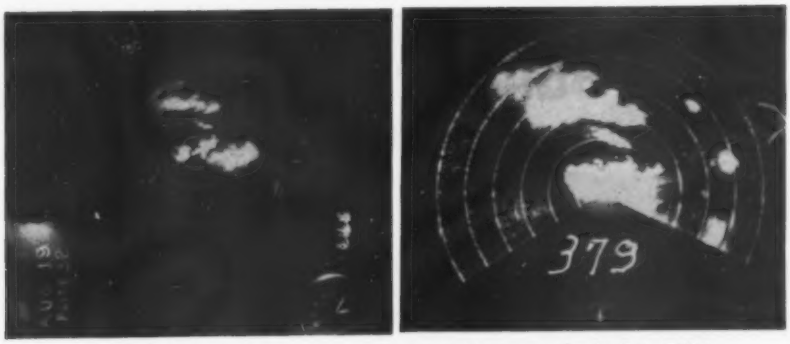
Northwest Airlines probably will get the first Lockheed Model 1049G Super Constellation. This is the version which will have a maximum gross takeoff weight of 137,500 pounds. NWA will have to be content with the 135,400-pound Model 1049E for the first two of its six Super Constellations, but the new DA4 engines which make possible the increased weights for the Model 1049G will be available in time to go into the remaining four planes.

•

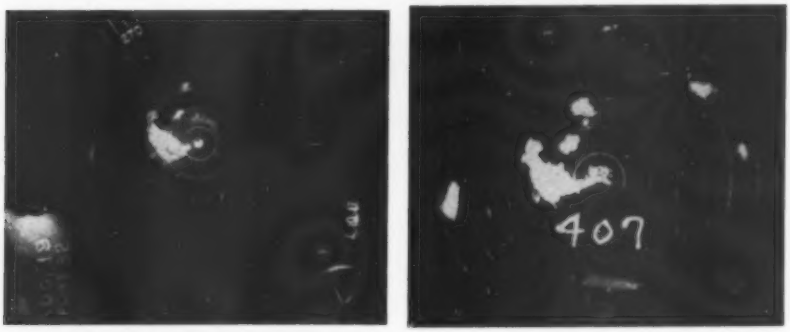
C. F. Thomas, military sales director for Lockheed, takes over as chairman of the aeronautical division of the Southern California section of the Society of Automotive Engineers for 1954-55, succeeding **Jack Hamilton,** vice president of Menasco, who moves up to vice chairman of the overall Southern California section.

•

Earl Slick is going in for faster airplanes. He recently bought an A-26 executive, and he is scheduled to get the first Learstar. Bill Lear, incidentally, expects to pick up 50 orders for Learstars in rapid succession just as soon as CAA type certification is announced. One reason for his confidence is performance is turning out even better than expected. On the test plane, which incorporates only part of the speed conversion, Lear has been obtaining 284 mph and keeping pace with DC-6's and Constellations on cross-country flights. The full conversion, of course, should be appreciably faster, and thus well above the guaranteed speed of 270 mph at 10,000 feet.



COMPARISON of 5.5 cm and 3.2 cm radar were obtained in UAL tests when Navy R5D was flown two miles behind United DC-3. The 3.2 cm (above right) paints larger echo at 11 o'clock than does 5.5 c m (left), and shows distorted view of other ilarge echo at o o'clock.



LARGE STORM echo at 9 o'clock appears about the same on both radars. On other echoes, 3.2 cm radar (right) gives larger returns, supporting conclusion by UAL that this radar tends to overpaint areas of very light rain, which are of no consequence in airline navigation through thunderstorms.

Airborne Tests Support C-Band Radar

Thunderstorm hunting tests constitute basis for airline weather radar specifications.

By Joseph S. Murphy

UNITED AIR LINES has documented the case for airborne radar in the 5.7 centimeter region (C Band) for airline weather penetration purposes.

UAL has now released a 108-page report on its June-October 1953 thunderstorm probing tests using an experimental model 5.5 cm radar built by Radio Corporation of America under contract to United. The aim was to find out if this new radar (as opposed to the 3 cm in wide use by the military) would do the job for the airlines.

Forty technical and operational flights were made, and in 133 hours of flying about 80 hours were spent either in thunderstorms or in their immediate vicinity. The report was written by Henry T. Harrison, manager of weather services, and Edgar A. Post, superintendent of navigation aids. The major conclusions:

• **Utility**—C-band radar was found "very useful" for safer and smoother navigation of storm areas. Pilots usually will be able to avoid moderate and heavier turbulence by detours of five miles or less from their planned flight. Smoother and safer departures and arrivals will result at airports during local thunderstorms, and the delays that now result will be kept to a minimum.

• **Penetration**—The radar will see through 15 miles or more of heavy rain greater than 60 mm/hr in density.

Hail - Tornado Warning — Although it gives a satisfactory warning of hail shafts, no evidence was found that it would identify a tornado or a tornado thunderstorm.

• **Collision Protection**—The radar will serve to avoid collision with terrain, but it has little, if any, use in avoiding collision with other aircraft.

• **Special Circuitry** — Showing those areas in a storm where the change from no rain to heavy rain occurs in the shortest distance (called Iso-echo circuitry) is a necessity. It will tell the pilot which "corridors" through a storm can be flown with safety.

• **Antenna Size**—A 22″ antenna gives adequate definition of storms and justifies radar use in aircraft which cannot be modified for the larger (30″) antenna preferred.

• **Ideal Range**—A radar scope with 5-, 10-, and 25-mile range marks tied in with selective ranges of 15-25, 40-60, and 100-125 miles would give a flexible arrangement compatible with aircraft speeds, yet taking full advantage of the radar's ability to see distant storms.

The UAL project formed the backbone of experience on which the Aeronautical Radio, Inc., airlines electronic engineering committee wrote its equipment requirements for airline weather penetration radar (American Aviation, March 1). This specification was only recently approved by the Arinc board of directors and has been circulated to its member airlines for approval.

On one flight during the test United was able to compare directly 5.5 and 3.2 cm radar when a Navy R5D was flown within a few miles of the UAL DC-3 (see photos). Although conceding this to be too limited a comparison, the airline's radar group did unanimously conclude that:

• **3.2 cm radar** showed appreciable attentuation and distortion while flying in or near heavy rainfall, whereas the 5.5 cm did not.

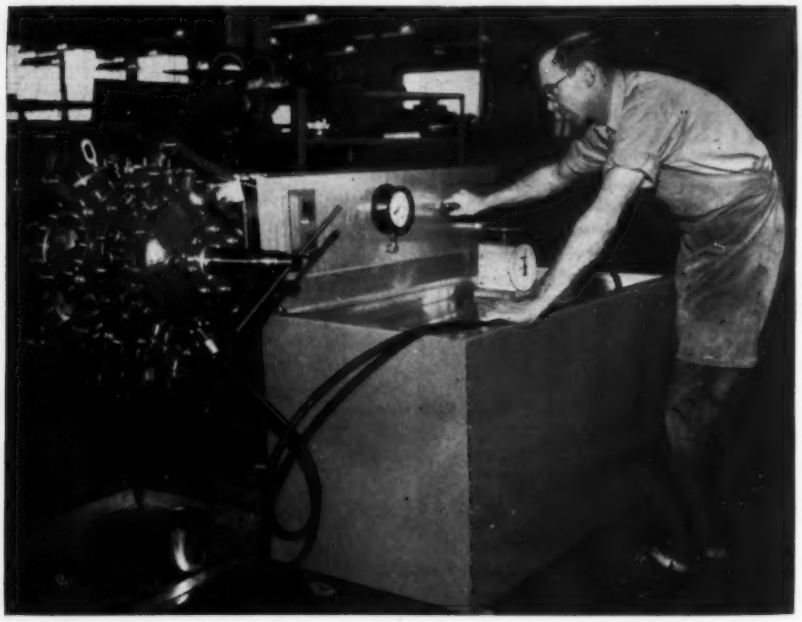
• **3.2 cm radar** tends to overpaint areas of very light rain. These are of no consequence in airline navigation through thunderstorms.

Mechanical performance of the radar was excellent, despite the fact that it was an experimental set. Neither the magnetron nor klystron had to be retuned during the entire four-month service period, and extensive measurements taken by RCA at the close of the tests were found to be within reading error limits of those taken when the equipment was first delivered.

• • •

TRIPLE view hood for scope allowed viewing by three crew members simultaneously.

Maintenance Bulletin Board



Mobile test unit shown here checks engine nose case oil pressure on P&W R-985 engines and is development of Southwest Airmotive Co., Dallas. Unit tests up to 700 psi pressure and uses a flexible Aeroquip hose for an oil feed connection to the propeller governor mount. Oil drip, which should not exceed one quart, is collected to be weighed on standard scales after testing.

New Washer Eases Bolt Preloading

A new washer that makes possible more accurate preloading of bolts used in aircraft assembly has been developed and placed in use by the Douglas Aircraft Company.

Tests with the washer show it can be designed to assure an average tension preload of 80% of the desired bolt preload with slight deviations. This will result in a sharp increase in the fatigue life of the bolts and tighter assemblies, Douglas engineers say.

The washers are now being used on the Douglas DC-6 and DC-7 series transports to join the lower half of the nose section to the fuselage, to join wing and fuselage, and for inner and outer wing attachment.

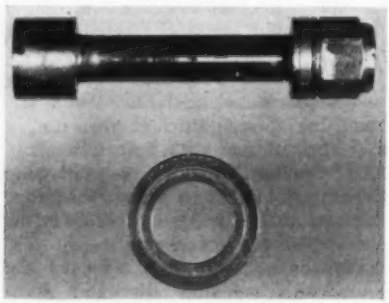
The new device, called a preload-indicating (or PLI) washer, eliminates the need for torque wrenches. It consists of two concentric steel rings. The inner ring, which is thicker than the outer ring, takes the load when the nut is tightened, allowing the outer ring to move freely.

Continued tightening of the nut compresses the inner ring until the rings bind. When the outer ring can no longer be moved, the desired preload has been reached.

The load at which the bind occurs can be controlled by choice of washer dimensions and the washer material.

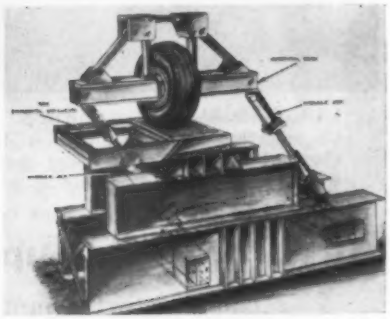
During the tightening operation the operator "wiggles" the outer ring by means of a disposable handle. This handle may be straight or especially shaped for easy access purposes.

The conventional method of controlling the preload in bolts and screws is the "torque wrench" technique which may produce inconsistent preloads in the fastener. It was not unusual to find the preload tensions scattered from 20% to 80% of the bolt yield strength as a result of normal variations in the dimensions of bolt and nut, the presence of lubricant, contamination, corrosion and the type of plating. Because of these variations, Douglas engineers found it necessary to specify a low torque wrench technique to avoid frequent over-tightening and breakage.



CLOSE-UP of PLI washer.

Although designed by Douglas for aircraft assembly work, the new washer can be used wherever accurate preloading of bolts is required. Development of the unit was under the direction of J. L. Waisman, assistant chief metallurgist, Santa Monica materials and processes department.



Combined side and vertical landing gear wheel loads can be applied simultaneously on this new wheel test equipment recently designed and built by Bendix Aviation Corp., Bendix Products Division. Special tread on base plate keeps tires from side-slipping under test loads.

Four Lines to Use DC-7 Airborne Analyzers

Four major airlines operating Douglas DC-7 aircraft have adopted airborne or portable-airborne ignition analyzers built by Bendix Aviation Corp. Scintilla Division. Airlines and installations are as follows:

- American Airlines will install the new Bendix type 11-3365-1 unit, a 21-pound system specially designed for airborne installations.
- National Air Lines will use the model 11-3350-3 as an airborne unit. This is a 25-pound version also adapted to portable-airborne and ground test usage.
- Both United Air Lines and Delta-C&S plan to use the 11-3350-3 as a portable-airborne instrument.

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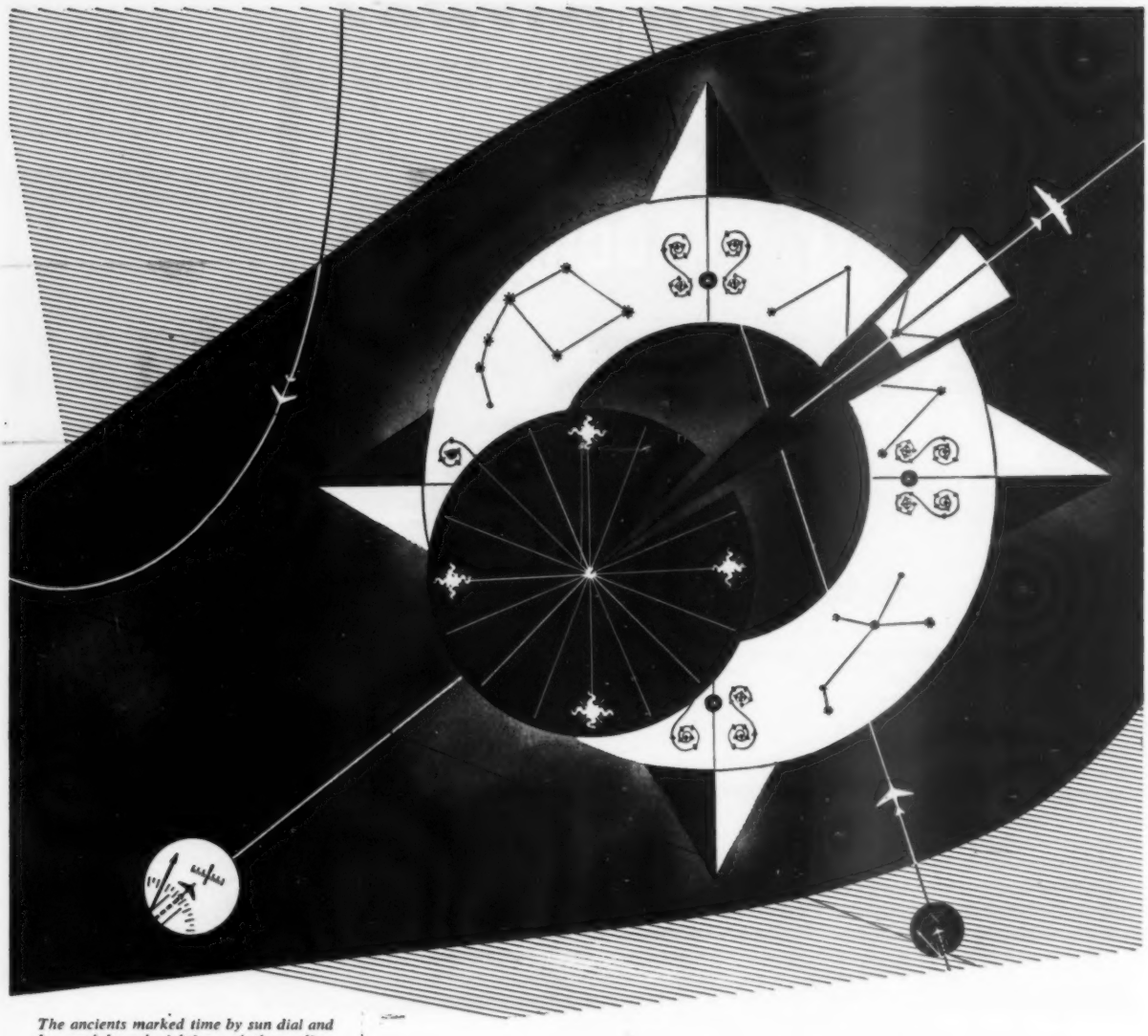

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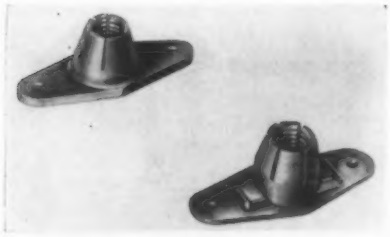
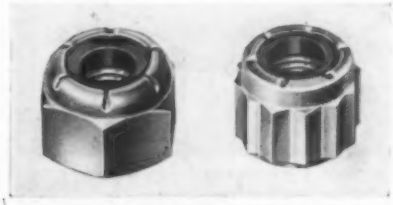
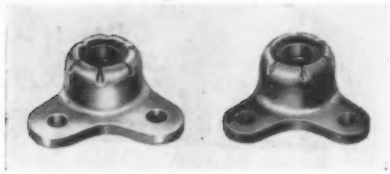


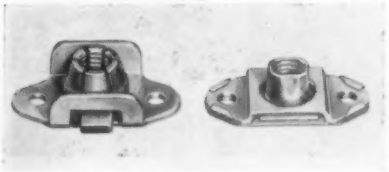
Type ZA1W



Type Y



Blue J Type



Type LH

NEW TYPES of locknuts are shown at right in each photo above; older, conventional model appears at left.

Four New Locknut Series by Elastic

Immediate production availability of four new series of lightweight aircraft locknuts has been announced by Elastic Stop Nut Corp. of America.

Results of the intensive research program that led to the new designs will produce weight savings ranging from 25% to 65% over conventional types in use today, company officials said.

The new ESNA designs emphasize:

• **Wide use** of newer high strength aluminum alloys. Materials used include 14ST-6, 14ST-7, 24ST-6, and 75ST.

• **Complete nut redesign** with emphasis on weight reduction while maintaining equivalent or higher strength.

The four new types include:

Blue J Type: High-strength aluminum locknuts, dyed blue for identification, are completely interchangeable with AN-365 steel locknuts. This type nut on the average is 65% lighter than equivalent steel parts, with weight savings per 100 parts running as high as one pound. Types available are hex, floating anchor, and gang channel nuts in sizes through ¼-28 and all are USAF, Army, and Navy approved.

Type Y: New steel, non-fixed nuts use a 12-point (double hex) wrenching design that produces an average 25% weight reduction over conventional hex nuts. Sizes range from 10-32 through ⅝-18. Other advantages growing out of this design are reduced installation edge clearances, and the ability to locate bolts closer together.

Type LH: An all-metal 550° F. design for anchor and gang channel nut applications, uses a cylindrical threaded area that is reduced in cross-section at the top at 90° intervals instead of the slotted beam locking action employed in other ESNA high temperature nuts. Weight savings average 45% over previous beam-type 550° nuts.

Type ZA1W: New two-piece all metal anchor nuts available in two types of stainless steel bodies, one rated for service up to 800° F. and another up to 1200° F. Nut bodies are machined from higher grades of stainless steel and bases from another grade that is lighter in weight and has good welding characteristics. Both parts are locked together, then spot-welded, for handling as a single unit.

Standard ESNA high temperature beam type nuts were machined from solid bar stock, and the new parts have reduced weight an average of 30% with no loss of strength.

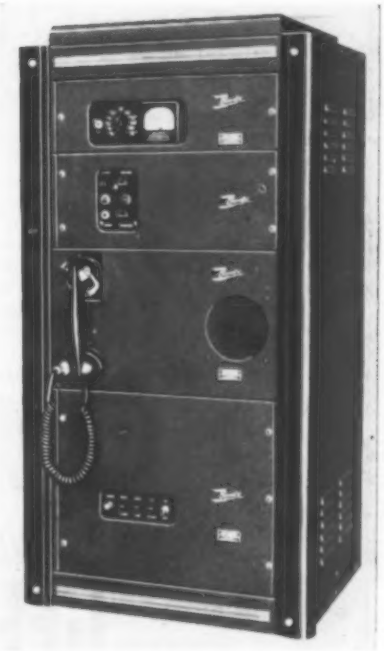
Address: **Elastic Stop Nut Corp. of America,** Dept. AAP, 2330 Vauxhall Road, Union, N. J.

Shim Stock. New aluminum shim stock uses laminated aluminum that is bonded over the entire surface and can be peeled for adjustment to the desired dimension. New material features light weight and freedom from corrosion and electrolytic action. Shims are produced either to blueprint specifications or as laminated sheet stock in thicknesses of .015″ to .125″, sizes 20″ by 48″.

Address: **Laminated Shim Co.,** Dept. AAP, Glenbrook, Conn.

Flaring Tool. An open-end hand flaring tool for easy formation of SAE 37° flares on copper, aluminum alloy, and steel tubing allows the user to observe the entire flaring operation. Called the Visi-flare, the tool ranges in weight up to one pound and is available for tubing O.D. sizes from ½″ to 1¼″.

Address: **The Parker Appliance Co.,** Dept. AAP, 17325 Euclid Ave., Cleveland 12, Ohio.



New Packaged VHF ground communications station equipment built by Bendix Radio, Div. of Bendix Aviation Corp., combines a TG-19 transmitter, RG-9A receiver, handset speaker panel, and transmitted modulator and power supply chassis. Recent order for 76 units by Chilean Air Force Commission for airport installations is slated for delivery this summer.

Compact Actuator. A new actuator which combines a two-phase reversible induction motor, a velocity signal generator, and a 50-to-1 gear train, yet weighs only 1 pound 14 ounces and is only 2⅛″ in dia. and 5″ long, has been announced by the Minneapolis-Honeywell Regulator Co.

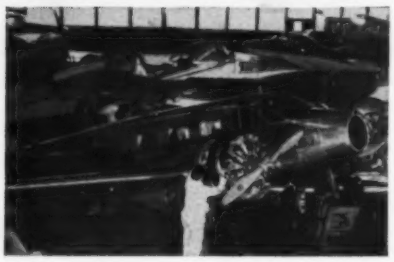
The new unit is called the MG13A actuator and is designed for driving ganged potentiometers, digital counters, or precise positioning applications. Output torque is

When YOU want it...is your Plane

in the air

or

in the shop?



If your industrial airplane flies 600 hours a year, it probably spends a month in the shop undergoing routine inspections. Why keep an expensive investment unflyable so long?

No need to with Reading's one-day 50 and 100-hour inspection service. By appointment, you can bring in your Dove or D-18 in the morning and fly it away that afternoon. How? No short cuts; no hurrying,—just the man power and engineered maintenance procedures for the most thorough inspection your aircraft ever had.

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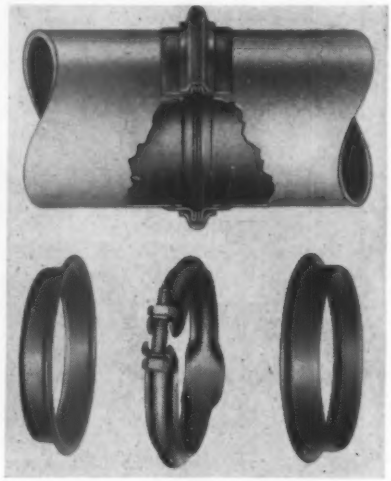
30 Rockefeller Plaza, New York 20, N.Y.
S-A-S serves more cities in Europe than any transatlantic airline

rated at 1 pound-inch continuous duty and 1.4 pound-inch stalled. Operation is from 240 volts, two-phase, 400 cps, or from 208 volts, single-phase, 400 cycle power supply.

Address: **Minneapolis-Honeywell Regulator Co.**, Dept. AAP, 2600 Ridgway Rd., Minneapolis 13, Minn.



Coupling Joints. Low-cost quick assembly joints for 1″ to 5″ O.D, tubing for coupling exhaust manifolds and exhaust piping are being produced in either stainless or cold rolled steel. Design stresses ease of application and speedy disconnect.

Address: **Marman Products Co.**, Dept. AAP, 11214 Exposition Blvd., Los Angeles 64, Calif.

Power Supply. Accurate 60-cycle power supply for operation of electrical devices is assured by new Type M-2027, 50-watt, frequency-stabilized power supply. Electrical characteristics are: input frequency range—50-70 cycles; power input—655 volt amperes; output impedance—1000 ohms; output voltage—115 or 230 volts.

Address: **Maryland Electronic Mfg.** Corp., Dept. AAP, College Park, Md.

Pressure Fuel Cap. A new pressure fuel servicing cap weighing only 0.79 pounds meets military standard MS-29526 for non-flush type caps as well as Spec. MIL-C-8605 which requires operation from —3 psi to +60 psi with burst pressure tests at 180 psi.

Design feature is a single piece stainless steel diaphragm using a pressure differential method of obtaining positive sealing under all conditions. Cap seal can be replaced without disassembly.

Address: **Gabb Special Products**, Div. of E. Horton & Son Co., Dept. AAP, Windsor Locks, Conn.

Waveguide Disconnect. For simplified maintenance of airborne electronics installations, a new waveguide quick-disconnect permits fast and positive decoupling of waveguide flanges without use of tools. Units have been designed

for waveguide sizes from .360" x .220" O. D. to 2.0" x 1.0" to maintain pressurized joints up to 30 psi at —55°C.

Address: **Airtron, Inc.**, Dept. AAP, 1103 W. Elizabeth Ave., Linden, N. J.

Universal Joint. A new aircraft universal joint using a center-block type construction for increased strength and longer life has been U. S. Air Force approved. Available in both light- and heavy-duty types, the new universal is equipped with a protective boot said to retain bearing lubricant for several months without sweating and to withstand temperatures from —67°F. to 300°F. without cracking, splitting or leaking.

Address: **Clary Multiplier Corp.**, Aircraft Div., Dept. AAP, 425 E. 54 St., Los Angeles, Calif.

New Jet Engine Control System from M-H

A new electro-hydraulic jet engine control system, tieing together all such variables as speed, temperature, area, and pressure into a coordinated control operation has been developed by Minneapolis-Honeywell Regulator Co., aeronautical division. It adjusts primary and secondary fuel flows and nozzle area to produce best engine performance under all speed, altitude, and ambient conditions.

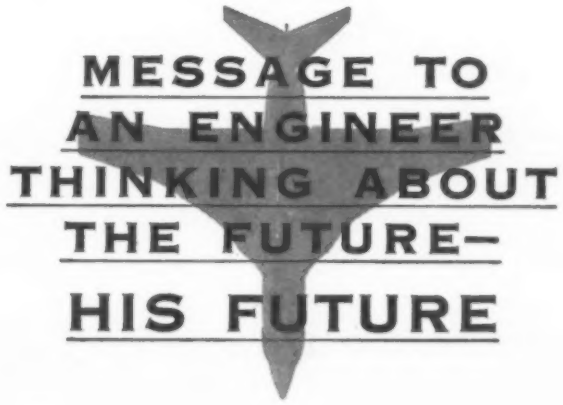
M-H engineers see a wide field for this type of control in the more complex jet engines now in the late stages of development.

The new system is fundamentally an electrical integrating device which senses engine output and then converts it into signals which can be compared with "called for" conditions in a computer network. When a performance deviation is sensed, an error signal is fed into an electro-hydraulic actuator to make the needed correction of engine inputs, either by fuel flow or nozzle area adjustment.

Basic features:

- **Complete primary** and secondary engine control;
- **Full utilization** of engine potential under all ambient conditions;
- **Adaptability** to various engine operating schedules;
- **Easily adjustable** speed, acceleration, and surge schedules.

System weight is approximately 100 pounds. By use of high-powered electrical-hydraulic actuators in high-gain, null-balance control loops, control sensitivity to such conditions as fuel contamination or parts wear is held to a minimum. One basic advantage of the device is the ability to use different jet fuels without the necessity of added adjustments.



Take a few moments now to review the progress of your career. Does your present position offer you a future that fully utilizes your creative abilities?

Compare your present assignment with the diversified, stimulating pursuits that increase the inventive challenge of Fairchild's team of qualified engineers. These men are working on engineering advances for the famous C-119 Flying Boxcar and the soon-to-be-produced C-123 Assault Transport. More than that, they are developing tomorrow's jet fighters . . . special reconnaisance aircraft . . . jet bombers and transports. The men at Fairchild know that *planned* project diversification keeps them in the forefront of the field of aerodynamics.

Gracious country living only minutes away from urban Baltimore or Washington . . . paid pension plan . . . an excellent salary with paid vacations . . . ideal working environment . . . generous health, hospitalization and life insurance . . . and the many other benefits of a progressive company add to the pleasure of working with Fairchild.

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GRAND RAPIDS BUILDING. (Grand Rapids, Mich.) Administrative offices of Grand Rapids Division; electro-mechanical products; instrument products; military autopilots; automatic flight controls; gyro stabilized platforms; gyroscopes; electric motors; precision gear mechanisms.

PICO BUILDING. (Los Angeles, Calif.) LearCal sales; West Coast engineering, service and customer relations offices for Grand Rapids and Lear-Romec divisions; West Coast accounting offices.

ELYRIA BUILDING. (Elyria, Ohio) Administrative offices, laboratories, engineering, manufacturing for Lear-Romec Division; aviation pumps for fuel, oil, water, and air; air motors; airborne air compressors; dehydrators; pressurizing equipment; oil-free industrial air pumps; fuel valves for missile engines.

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or aviation's precision needs

NOW THERE ARE just bricks and mortar. But soon a *tradition* will be installed. Early this summer, when this new Lear building reaches completion, it will be equipped—in addition to its tools, production facilities, laboratories, and administrative offices—with a quarter-century of varied and intensive experience in the development and manufacture of high-precision electronic and electro-mechanical devices.

Today Lear is one of the largest producers in the world of automatic flight stabilization equipment, aircraft pumps, aircraft radio, electronic navigational devices, aircraft instruments, gyros, and aircraft electro-mechanical actuators.

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CP-5

LEAR

Manufacturing Salaries

Aggregate payments of more than $30,000 to company executives, according to reports filed with the Securities Exchange Commission (continued from May 24 issue).

• **CESSNA AIRCRAFT CO.:** Dwane L. Wallace, president, $43,333.36 (up $3,333.36) plus $21,666.68 bonuses; Thomas B. Salter, vice president, $24,666.64 (up $1,666.64) plus $12,333.32 in bonuses; Frank A. Boettger, vice president and treasurer, $27,999.96 (up $3,666.96) plus $13,999.98 in bonuses.

• **CONSOLIDATED VULTEE AIRCRAFT CORP.:** Joseph T. McNarney, president, $76,860 (up $26,125); J. V. Naish, executive vice president, $46,356.72; Robert B. Watts, vice president and general counsel, $38,180.06 (up $180.06); La Motte T. Cohu, vice chairman of the board and consultant, $31,500 (down $13,500); W. C. Rockefeller, executive assistant to board chairman, $31,305.05 (down $3,694.95); Floyd B. Odlum, chairman of the board, $30,916.67.

• **CURTISS-WRIGHT CORP.:** Roy T. Hurley, chairman of the board and president, $146,721.33 (down $42,828.67); George R. Hill, vice president-finance, $47,721.21; Edward M. Powers, vice president-engineering, $55,490.84 (down $11,741.16). (Incentive compensation award payments included.)

• **DOUGLAS AIRCRAFT CO.;** Donald W. Douglas, president, $150,174 (up $15,419); F. W. Conant, senior vice president, $93,848 (up $24,700.20); Arthur E. Raymond, vice president, $70,685 (up $9,557.93); Donald W. Douglas, Jr., vice president, $37,923; Frederick E. Hines, vice president and tax counsel, $34,481 (up $7,347.34); Nat Paschall, vice president, $32,404.

• **FAIRCHILD ENGINE & AIRPLANE CORP.:** Richard S. Boutelle, president, $113,438 (up $7,568); Arthur F. Flood, executive vice president and comptroller, $81,434 (up $5,142); Willard L. Landers, vice president, $56,796 (up $5,135).

• **GENERAL DYNAMICS CORP.:** John Jay Hopkins, chairman and president, $123,784.67; J. Goeffrey Notman, senior vice president and Canadair president, $88,400; Lawrence B. Richardson, senior vice president and Canadair vice chairman, $48,520.50; O. Pomeroy Robinson, Jr., senior vice president, $43,200; Frank Pace, Jr., executive vice president and Canadair vice chairman, $36,648.35.

• **GRUMMAN AIRCRAFT ENGINEERING CORP.:** Leo A. Swirbul, president, $66,250 (up $4,750); William T. Schwindler, executive vice president, $55,250 (up $4,000); Leroy R. Grumman, chairman of the board, $55,200 (up $3,950); E. Clinton Towl, vice president, $35,450 (up $2,650).

• **LOCKHEED AIRCRAFT CORP.:** Robert E. Gross, president, $130,830.46 (up $11,655.46); Courtlandt S. Gross, executive vice president, $98,085.08 (up $8,460.16); C. A. Barker, Jr., vice president and treasurer, $92,595.46 (up $8,295.22); Cyril Chappellet, vice president, $71,430.38 (up $6,105.06); Hall L. Hibbard, vice president, $71,280.38 (up $6,480.06); Carl B. Squier, vice president, $62,370.07 (up $5,669.79).

• **McDONNELL AIRCRAFT CORP.:** James S. McDonnell, Jr., president, $62,432 (up $7,401) plus $8,214 in pensions; C. Warren Drake, vice president, $33,806 (up $4,075) plus $3,034 in pensions; Robert H. Charles, vice president, $31,757 (up $7,964) plus $2,526 in pensions, Kendall Perkins, vice president, $26,404 (up $3,940) plus $2,461 in pensions; Don R. Berlin, vice president, $25,779.

Bendix Builds a Better *cable clamp* the AN3057B

Inexpensive • Efficient • Versatile

The new Bendix AN approved AN3057B cable clamp is now available. Engineered by Bendix to the highest quality standards, this cable clamp offers major design improvements. The clamping action is radial and completely eliminates wire strain and chafing by holding the wire bundle firmly in rubber. This clamp will accommodate a wide range of wire bundle sizes, but an even greater range can be handled through the use of the Bendix AN3420A accessory telescoping sleeve.

The new AN3057B cable clamp will also waterproof multi-conductor rubber covered cable on the rear of a connector, or where moisture-proof entrance through a bulkhead or into an equipment box is required.

This versatile clamp is a product of the Scintilla Magneto Division of Bendix Aviation Corporation and is a companion AN accessory to the world famous Bendix Scinflex line of electrical connectors. Write our Sales Department for details.

Outstanding Features

- Neoprene gland.
- Centered clamping action.
- Increased close down.
- Positive grounding feature.
- Cadmium plated die-cast aluminum nut.
- Shorter over-all length.
- Waterproofs multi-conductor cable.
- Immediate delivery.

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Extra Section

By Joseph S. Murphy

FEW aviation technical sessions these days could measure up to the recent Philadelphia meeting of the Radio Technical Commission for Aeronautics when it comes to bringing out the real pioneering talent in a particular field of aviation. Although the total RTCA attendance numbered only slightly more than 200, by far the better part were people who formed the early backbone of what is today a big aeronautical communications and navigation business.

Most of the credit for the turnout goes to Western Electric's F. C. "Mac" McMullen who on the side organized a reunion of the "Pillars of Aviation Radio." McMullen himself qualifies as one of the "pillars," having pioneered along with H. N. Willets, also of W-E and in attendance, in selling much of the first air-ground communications equipment.

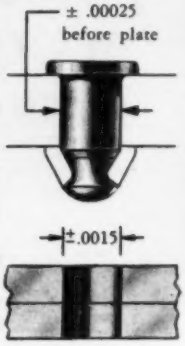
Just to name a few of the leaders among the old-timers on hand (space wouldn't permit a complete listing) and their early activities, we'd choose: **Dr. David G. C. Luck** of RCA—inventor of the VHF omnirange and source of many other notable contributions to aeronautical navigation. **W. L. Webb**—now with Bendix Products Div., missile section, who developed the ADF. **J. S. Anderson**—president of Aeronautical Radio, Inc.—with Boeing Air Transport, United Air Lines predecessor, pioneered in one of the first mobile weather communications stations proving out air-ground weather reporting. **P. C. Sandretto**—of Federal Telecommunications Laboratories—first with Bell Laboratories, then United Air Lines, collaborated with **H. M. Hucke** (also attending) in early work in precipitation static and development of aircraft power supplies. Hucke is now with Bendix Radio Division. **F. B. Woodworth, F. X. Rettenmyer, J. R. Newhouse,** and **H. B. Fischer** at Bell Laboratories worked out first development of aviation communications equipment. **D. Fred Hambrick**—originally with Boeing Air Transport and now with UAL, made first BAT radio installations and later flew initial evaluation flights with Sperry autopilots in United aircraft. **J. B. Bartow**—Bartow Beacons, Inc., invented high intensity directional runway lighting. **C. C. Shangraw**—originally with Universal Aviation, American Airlines predecessor, now with Bendix Eclipse Pioneer, worked out original air traffic control system planning with **Paul Goldsborough** (TWA) and **J. R. Cunningham** (UAL). **C. A. Petry** (Arinc) and **G. E. Mears** (AA)—who with **R. E. Whitmer** back in 1936 laid the groundwork for the first airways traffic control communications facilities. **W. P. Lear**—now board chairman of Lear, Inc., an early Chicago radio broadcasting pioneer, entered aviation with direction finding equipment just before World War II, later won the Collier Trophy for autopilot development. **D. S. Little**—American Airlines, pioneer in early air traffic control development and flight testing of airborne radar. **J. C. Franklin**—Atomic Energy Commission, one of the early founders of Aeronautical Radio, Inc., when with TAT, predecessor of TWA. **Ford Studebaker**—v.p. operations, Hawaiian Airlines, took the citation for farthest traveller to the reunion. Studebaker was communications pioneer with Universal Aviation, AA predecessor.

Again, these were but a few of the "pillars" on hand. The list of names and their contributions in the development of aviation radio would fill a book. "Mac" McMullen's venture in bringing them together again could only be termed a complete success.

CAA's Technical Development and Evaluation Center at Indianapolis has figured out a novel approach to meeting the labor problem in the operation of its new air traffic control simulator. The unit only gets intermittent use as ATC problems are given to TDEC for simulation and solution, and the repeated hiring, training, and firing of operators would really be a headache. To overcome these obstacles, the wives of the CAA engineers fill in as part-time employes on the project, making experienced "pilots" available all the time. This also helps to keep expenses down, since the average wage they collect is that of a GS-2, only $2750 on an annual basis.

Reversing the usual procedure of inserting a semi-close tolerance fastener into a close tolerance hole–

HS51P-52P series HI-SHEAR rivet with a close tolerance shank, fits into a semi-close tolerance hole, pilot and core drilled.

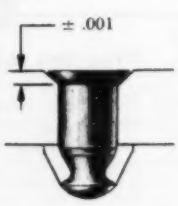


This easier made hole

reduces installation costs

Additional savings are realized in less drilling skill needed, equipment and inspection.

The head shaving operation, to achieve surface smoothness, is eliminated by installing this close tolerance head style HI-SHEAR into a properly prepared countersunk or dimpled hole.



160,000-180,000 psi heat treat–lead chamfer to aid interference fit–cadmium plated after grind to prevent corrosion.

Write for the HI-SHEAR Standards Manual

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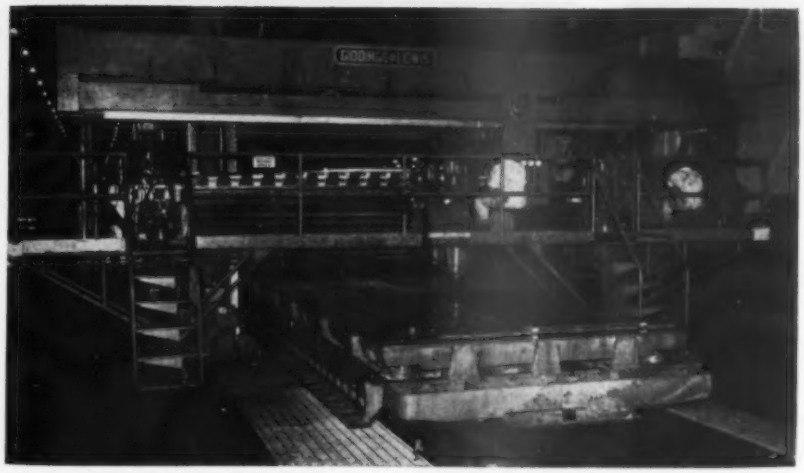

PORTABLE CATWALK provides work space for two operators as machine heads move from side to side and work travels beneath them on welded steel table.

Biggest Skin Miller in Use at Douglas

Largest of its type in world used in F4D and A3D production; works to .0015" tolerances.

THE world's largest spar and skin milling machine is now being used at Douglas-El Segundo in work on the Navy's F4D interceptor and A3D jet bomber.

The machine, designated G&L Hypro 100, weighs 250 tons and measures 90 feet long, 30 feet wide, and 26 feet high. It can handle an aluminum plate 40′ by 10′. A crew of two operates the unit, which can work to tolerances of .0015 inches.

The development of such machines has been brought on by the requirements of high speed aircraft. With wings and tails constantly growing thinner, yet needing greater strength to withstand the loads of flight near the speed of sound, the industry has turned to the use of large sections made all in one piece and designed to reinforce themselves.

One wing section, milled from a single slab of metal eight feet long and four feet wide, replaced a total of 29 parts and eliminated 1300 rivets.

In order to provide for a supply of such machines, the Navy began the Naval Industrial Reserve Aircraft Program over two years ago. The machine now in use at Douglas is one of a series slated for the El Segundo division. It was built, to Douglas specifications, by the Giddings and Lewis Machine Tool Company of Fond du Lac, Wis.

The work moves beneath the cutting heads at a rate of 150 inches per minute, traveling on a welded steel table. Manual clamps and vacuum chucks hold it in place. The operators work from a movable catwalk which straddles the work table, directing the operation by means of a push-button control board manufactured by General Electric.

Twelve motors drive the cutting heads, with a total of 350 horsepower. Power supply comes from 18 motors and generators, while a 20 hp motor drives the work table. The three cutting heads move back and forth on their guide rails, powered by smaller motors.

Channels of cutting fluid run along each side of the work table, carrying metal chips away at 900 cubic inches per minute.

One feature of the machine is an Onsrud cutting head that is automatically guided by a template. The carbide teeth of the cutter revolve at speeds as high as 7200 rpm. • • •

CLOSE-UP shows one operator at controls with plastic face shield.

The plant with a one-track mind...

Actually Twin Coach Aircraft Division is five plants—each devoted *exclusively* to aircraft production. We do no other work; we build no other products.

Here's why this is important. It means your airframe assemblies are built by experienced aircraft specialists . . . men who know no other standards than those of the aircraft industry.

So if you have an assembly you're thinking of subcontracting, call in Twin Coach Aircraft Division for consultation. You'll be secure in the knowledge that it's built by men who think like you . . . men whose one thought is to produce to specification and on schedule.

The five plants comprising the Twin Coach Aircraft Division have over 3200 employees, over half a million square feet of manufacturing area, and cover 23½ acres at the Municipal Airport, Buffalo, New York.

A-9451

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People

MANUFACTURING

Henry H. Ogden has been elected vice president and Burbank plant manager for Lockheed Aircraft Service. Ogden will also continue his supervision of Lockheed's Ontario, Calif., installation.

C. J. Higgins and **Fred Gebhardt**, formerly with Air Associates, Inc., have joined Best Aircraft Corporation, as president and vice president respectively.

Charles A. Sereno of Air Associates, Inc. has moved up from chief engineer to vice president and general sales manager of the firm's electronic and mechanical products divisions.

William H. Schwebel and **Don L. Walter** have recently been elected vice presidents of Marquardt Aircraft Co. Schwebel has been designated vice president-finance, and Walter, vice president-operations.

Frank W. Davis has been named chief engineer of Consolidated Vultee's Fort Worth Division to succeed **J. W. Larson**, resigned. Before his move to Fort Worth, Davis was assistant to Convair's vice president of engineering.

Paul W. Polk has been elected president of the Threadwell Tap & Die Co.

Robert Oster, executive vice president of the John Oster Manufacturing Co., has taken over the sales duties of the firm's Aviation Division, following the resignation of **Stanley J. Zak**, formerly Aviation Division sales manager.

Howard L. Hartman has been named general sales manger of Aircraft Engine and Parts Company. Previously, Hartman was director of sales for the Babb Company.

Carl F. Baker has moved from chief engineer to quality manager at Hamilton Standard, division of United Aircraft Corporation.

General Omar N. Bradley, former chairman of the Joint Chiefs of Staff, has joined the technical advisory board of the Aerojet-General Corporation.

Bradley

Kimball

AIRLINES

Frederic P. Kimball, aviation consultant, and recently a partner in the firm of Kimball & Gill, has established new offices in Westport, Conn.

R. Eugene Orr of Jacksonville, Flor-

Leave New York at noon — reach Los Angeles before 5 p.m. on United Air Lines' DC-7s, nonstop coast to coast!*

ALREADY OFFERING your fastest flights, nonstop between San Francisco and New York — United's deluxe DC-7 Mainliners now are also flying nonstop between New York and Los Angeles. You can leave New York on "THE CONTINENTAL" at noon, arrive in Los Angeles at 4:55 p.m. (local times). Eastbound it's only 7¼ hours nonstop!

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ida, has been elected to the board of directors of Southern Airways.

L. John Eichner, who joined Trans Texas Airways last year as traffic and sales general manager, has been elected the firm's vice president of traffic and sales.

John H. Sullivan has been named assistant to Braniff Airways vice president **R. V. Carleton,** to assist in the administration of the line's operations department.

Evelyn V. Waters, executive secretary of the National Air Taxi Conference for the past three years, has been named the conference's executive vice president.

E. W. Fuller has resigned as director of staff engineering for American Airlines to accept a post with **REF** Manufacturing Co.

G. W. Fleming has been appointed vice president and general manager of Flight Service, Inc. Fleming comes to Flight Service from the Sports Car Club of America, where he was national business manager.

Carl W. Rach and **James E. Reinke** have been elected vice presidents of Colonial Airlines. Rach moves up from operations manager to vice president of operations; and Reinke moves up from general traffic manager to vice president of traffic and sales.

Nicholas Craig has been elected president of Icelandic Airlines from his previous position as general manager.

J. E. Nickson, formerly director of traffic services for Trans-Canada Air Lines, has been appointed to the line's newly created post of general traffic director.

Edwin W. Breed has been named assistant to the vice president of sales for Northeast Airlines. Prior to his new post, Breed was district sales manager for NEA in New Hampshire.

A. J. Pierce has been advanced from assistant to manager of overseas lines for Canadian Pacific Air Lines.

Charles W. Grosser, formerly Northwest Airlines' manager of tours and convention sales, has joined The Travel Ship Agency in Minneapolis as a partner.

• **F. W. Schmitt,** North American Aviation, Inc. Chief of contract pricing. Los Angeles. 25 years.

• **H. Webster Crum,** Goodyear Aircraft Corp. Sales manager, Akron. 25 years.

• **K. P. Arneson,** United Air Lines. Lead station agent, Reno. 25 years.

• **Frank C. Asher,** United Air Lines. Station ground services manager, Sacramento. 25 years.

• **George L. Boyd,** United Air Lines. Captain, Seattle. 25 years.

• **E. J. Eshleman,** United Air Lines. Captain, Los Angeles. 25 years.

"COMO SE LLAMA?" "*What is it called?*" Spanish explorers asked when they saw the curious animal. That's how the llama got its name

"Nowhere else in the world but in South America . . ."

". . . nowhere else, can you see graceful llamas loping up the hillsides. They're a symbol of good luck."

And just as unique to South America is Panagra's "Fiesta Lounge" aboard *El Inter Americano*, where you see home-coming passengers showing silver keepsakes. This is the famous lounge where you can relax in comfort while, far below, distance sweeps by at 300 miles an hour. The "Fiesta Lounge" flight of *El Inter Americano* . . . world's fastest DC-6 . . . only 16¼ hrs. in the air from Miami to Buenos Aires.

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PANAGRA

Pan American-Grace Airways

No BNF-Panagra Merger by Deadline

The 60-day period set by CAB for airlines to come up with a plan to integrate international routes of Braniff Airways and Pan American-Grace Airways, expired May 26, minus a plan but with both sides apparently willing to continue negotiations. At press-time, CAB was considering whether to extend the period or take other action.

According to a Braniff letter to CAB on the deadline, 43 days expired before Panagra officials agreed to discuss a possible integration of the two systems. During that time Braniff took these actions: **April 5,** set up a special committee to explore an agreement with Panagra owners; **April 7, 15, and 27,** Braniff approached Andrew B. Shea, Panagra president, unsuccessfully in the matter of discussing a possible agreement.

Willing to Meet

On **May 12,** Braniff related, Shea advised Ferdinand Eberstadt, chairman of the special Braniff committee, that representatives of Grace and Pan Am would be willing to meet the next day with Braniff. On **May 13,** a meeting was held in New York. Here is how Braniff described what transpired at that meeting:

". . . the representatives of Grace and Pan American advised that if Braniff were disposed to withdraw entirely from its South American operations, Pan American and Panagra would be willing to pay a fair and reasonable price for Baniff's equipment and facilities in South America."

Unacceptable Offer

Braniff's directors met on **May 20** and decided the Panagra offer was "unacceptable." It was a unanimous vote by the directors, Braniff said.

The Braniff board at that same meeting drew up a counter offer which was transmitted to Panagra representatives on **May 24** in New York. Braniff's proposal was that "it transfer its routes and properties to Panagra, receiving capital stock of Panagra in exchange." This was rejected by Grace and Pan Am.

No Proposal

Subsequently, Braniff told CAB, Shea communicated with Eberstadt and stated "that Grace and Pan American intended to submit a further proposal to Braniff within a week. As of this time, no such proposal has been received by Braniff."

The Panagra-Braniff merger possibility is an interim development in the highly controversial New York-Balboa Through Service Case. Primarily involved in that case are proposals for through interchange service between New York and Latin America. Pan American, Panagra, and Eastern want to linkup on one side, while Braniff advocates an interchange for it with Eastern, and National seeks to join Pan American and Panagra.

60-Day Period

In setting the 60-day period for negotiations on a possible Panagra-Braniff merger, to be owned by an "independent" company, CAB deferred action on the pending interchange proposals, Its decision now is to either grant extension of the period for talks on the Panagra-Braniff issue or rule immediately on the interchange proposals.

Meanwhile, there have been indications that Delta-C & S Air Lines (with an extensive network of Caribbean routes) and National Airlines (with a Miami-Havana segment, plus its coveted New York-Miami authorization) were considerably interested in a possible three- or four-way merger proposition involving international routes. • • •

CAB NEWS

AS OF NOW . . .

Hearings in the **Large Irregular Air Carrier Investigation** concluded May 19, in Washington, after 20 months. Oral transcript totaled 30,066 pages or 274 volumes—over four times the size of the previous record high. Next development will be a CAB staff position to be given between now and the August 23 deadline set for briefs.

Hearings in the **North American Airlines Enforcement Case,** which appeared about to end in Los Angeles in March, have since been held in Washington, Miami, and New York, and may even wind up in Seattle. CAB concluded its presentation in March with the remainder of hearings since then dealing largely with North American's contesting of the validity of CAB's nonscheduled airline regulations.

Oral arguments were heard by CAB last month in the **Trans-Pacific Renewal** and **U. S.-Hawaii Cases,** with both proceedings now before the Board for decision preliminary to final White House action. Another ripe for White House action is the **Trans-Atlantic Cargo Case** in which Seaboard & Western has been recommended for an all-cargo certificate.

The **Additional Southwest-Northeast Service Case,** one of three current major route cases, will get under way with hearings on July 21, not July 7, as originally scheduled by CAB.

RECENT CAB DECISIONS

• **Braniff Airways** to show cause why annual Latin American mail pay should not be $2,671,000, or about $800,000 under previous Board estimate, with full reduction in subsidy element.

• **Frontier Airlines** granted exemption to carry local traffic on flights between Denver and Pueblo.

• **Northeast Airlines** authorized to suspend at Provincetown, Mass., for "mandatory" five-year period.

• **Pan American World Airways** granted continued exemption for nonstop flights between Havana, Cuba, and San Salvador, El Salvador.

CAB CALENDAR

June 7—Hearing in Trenton Service Case (Allegheny Airlines et al.). Washington, D. C. Docket 6435 et al.

June 8—Oral argument in Williston Basin Area Case. Washington, D. C. Docket 5777 et al.

June 15—Hearing in United Air Lines' Hawaiian Mail Rate Case. Tentative. Docket 2913.

June 15—Oral argument in Ozark Airlines Certificate Renewal Case. Washington, D. C. Docket 5988 et al.

June 22—Oral argument in Service to Fayetteville, Ark. Case. Washington, D. C. Docket 5592 et al.

June 30—Hearing in Trans-Pacific Airlines Renewal Case. Honolulu, T. H. Docket 6434 et al.

July 7—Hearing in Fairmont-Fort Dodge Service Case (Braniff Airways). Tentative. Docket 4052 et al.

CAB MISCELLANY

Mohawk Airlines applied for new segment between Binghamton-Endicott-Johnson City and Boston via Poughkeepsie, Hartford, and Providence.

•

Northeast Airlines wants New York-Washington application considered if CAB expands Norfolk-Atlanta Nonstop Investigation into an eastern area case.

•

Capital Airlines applied for new Norfolk-Atlanta segment via Elizabeth City, Rocky Mount, Raleigh-Durham, Greensboro-High Point, Winston-Salem, Charlotte and Asheville.

•

Allegheny Airlines asked for right to fly Cleveland-New York and Cleveland-Philadelphia with only two intermediate stops in lieu of present four.

•

Pan American World Airways withdrew proposed fare cuts scheduled for June 5 between Miami and Central American points. TACA International Airlines had protested.

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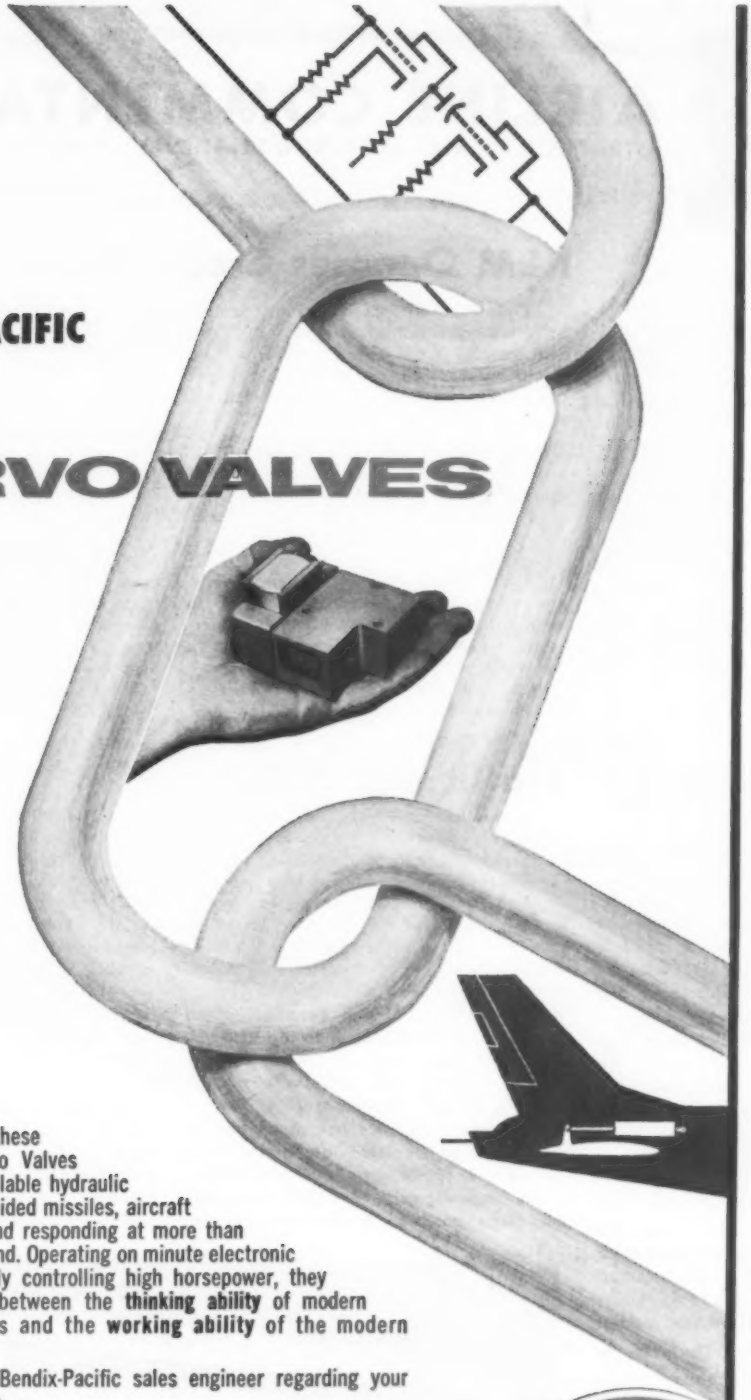

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AIRLINE COMMENTARY

• TRAFFIC • SALES • PUBLIC RELATIONS • *by Eric Bramley*

Simplified ticketing is something that's been urged in this industry for years. Top management puts the heat on the boys down the line to cut out paperwork and make it easier for passengers. There are squawks in the press (including us). We got the other side of the story recently during a bull session with some of the reservations and ticketing experts. "The heat's on us to use pre-prints," said one. "But how are we going to do it when tariffs keep getting more complicated? A small example—one of our fastest trips between two cities involves a combination of night coach and first-class one-way and day coach and first-class the other. What with all these fares, plus family plan and other gimmicks, an agent has to be a genius to quote the correct price."

•

Who started air coach? United Air Lines makes a claim. On April 10, 1940, it opened Los Angeles-San Francisco service charging 3½¢ per mile on Boeing 247-D's (smaller and slower than UAL's DC-3's). Fare was $13.90 one-way, $25 round-trip (today's coach fare is $13.50 one-way), or 26% cheaper than DC-3. As a note of interest, AMERICAN AVIATION's files show that UAL started the service at a time when its LAX-SFO Boeing flights were averaging 3.5 passengers (10 seats); 21-passenger DC-3's were averaging 13.7. UAL operated the service until April, 1942, when a lot of its equipment went into military service.

•

First progress report on the Z-circuit, new teletype set-up in Chicago and New York for handling interline reservations, shows that 98% of messages are being handled within two hours. Time under the old telephone method was five hours to two days. Look for the system to be extended.

•

Those readers who contributed so generously three years ago through this column to the Mary Frances Housley Foundation will be interested to know that her "living memorial" has been dedicated. Your money was put to good use—the memorial is a nurses' housing unit at Variety Children's Hospital, Miami. Miss Housley was the National Airlines stewardess who gave her life in a futile attempt to save an infant from a fire following a landing accident at Philadelphia.

KLM Opposes Credit Plans

Difference of opinion among trans-Atlantic operators regarding value of vacation credit plans became evident last month with announcement by KLM Royal Dutch Airlines that it will not institute such a system.

KLM feels that the numerous credit plans with which travel agents will be confronted will result in confusion because each plan differs in conditions, paper work and financial responsibility, according to M. E. A. L. de Jong, U. S. traffic and sales director. He said that credit plans may tempt clients to overbuy, resulting in financial hardship upon their return from overseas. Passengers insisting on credit should be referred to a bank "where they can borrow at normal rates which are 20% to 60% lower than any travel . . . plan rates," he stated, adding that travel agents have been informed of KLM's position by letter and that most of them agree.

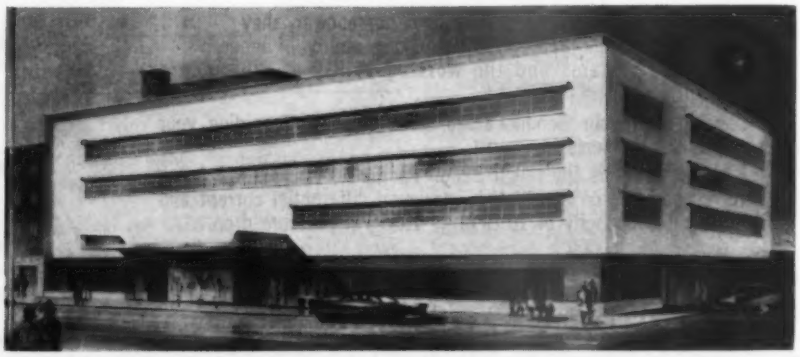
Pan American, on the other hand, reports that its "pay later" plan (through Beneficial Loan System), the first one announced, is resulting in about 50 new customers daily, with the average ticket valued at $700 to $800. Scandinavian Airlines System has a plan, good only in the five New York boroughs, with Chemical National Bank. SAS offices throughout the country are to make similar arrangements with banks in their areas. SAS claims the interest rate from banks is lower than from loan companies and that it doesn't have to assume financial responsibility on overdue loans. TWA is also known to be considering a plan.

Traffic and Sales

Increased passenger fares (up about 4.5%) are now effective on **Pioneer Air Lines and North Central** (non-competitive segments). Pioneer has now filed a downward revision for June 13 (small changes, mostly under $1) to eliminate errors in fare construction . . . **Pan-American** has withdrawn proposed tourist fare reductions between Central American points and Havana and Miami. Proposal, which had been protested, is held up pending review of all western hemisphere fares at IATA fares and schedules committee meeting in Ste. Agathe, Quebec, July 6.

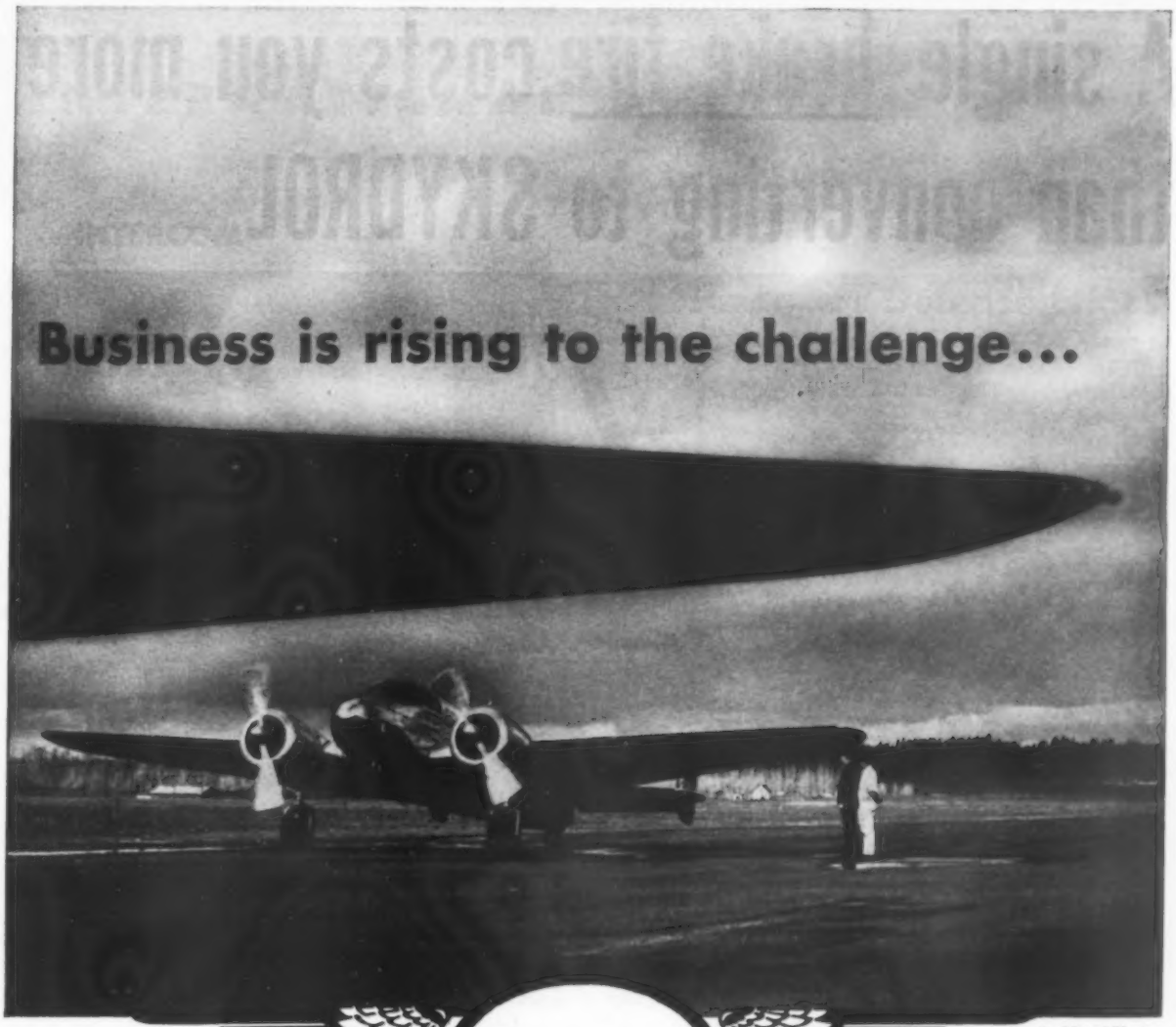
American Airlines has designated 14 flights to be operated exclusively with DC-6B's. Purpose is to concentrate **maximum cargo capacity** on flights with highest cargo potential (combination passenger-cargo DC-6B will carry more cargo than DC-6). Flights involved are New York and Chicago to Mexico City, New York-Los Angeles, New York-Chicago, New York-Louisville . . . AA opened its first drive-in ticket office in Merchants National Bank & Trust, Syracuse.

Pan American is converting five DC-4's to **"flying station wagons"** which can be adapted to haul a full passenger load, full cargo load, or half-and-half. The 68 seats can be removed or folded and stored in the cabin . . . PAA is now offering **7,386 New York-San Juan seats weekly** against 5,200 last year . . . It has also replaced four daily Miami-Havana and two Miami-Nassau **Convair flights with DC-6B's** . . . **United Air Lines** is experimenting with reserved seats on some flights.



New West Side Airlines Terminal, on corner of 42nd St. and 10th Ave., New York, is scheduled for completion in early 1955. It will handle passengers to and from Newark Airport. Major lessee is West Side Airlines Terminal Corp., wholly owned by American, United, National, Northwest, TWA, Allegheny, and Mohawk.

Business is rising to the challenge...



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Qty.	Brake	Net Price
2	Brake Assembly	$ 870
2	Tires	556
2	Flexible Hose Conn.	20
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INTERNATIONAL AVIATION

Edited by Anthony Vandyk

INTERCOM

PARIS—This is being written after 10 days of movement—Washington, New York, Montreal, London and Bordes (it's at Bordes, a little French village near the Spanish frontier that Turbomeca, Europe's most unusual turbine engine plant, is located). These are a random few jottings of impressions to date.

The flight over was unusual in two respects. It was Trans-Canada Air Lines' first trans-Atlantic crossing with Super Constellation equipment and it was timed so as to enable the passengers to sleep in Montreal one night and in London the next. By coincidence, hotels with the same name (Mount Royal) were used in both cities.

London Airport is hopelessly overcrowded and unworthy of the city it serves from the passenger facilities aspect. London's second airport, Northolt, is to be closed in the fall and then the situation will become much worse. New, permanent buildings are being constructed at London Airport but it will be some two years before they are available for use. Strangely enough these new buildings will not include a hotel (at the moment passengers on delayed aircraft have to be taken up to 15 miles away to be given overnight accommodations).

While sniping at the British Ministry of Transportation and Civil Aviation, which operates London Airport, mention must be made of the very unfavorable impression on departing passengers by continuation of the ministry's 70 cent tax. This is levied on all who leave on international flights. Why the ministry does not levy a similar charge on sea passengers at ports of departure is a mystery.

Finally, a word of praise on the clockwork precision of both Air France's and British European Airways' London-Paris services. The flight is so short that considerable dexterity is required to serve a full meal to as many as 55 passengers on the 225-mile flight. The services of both companies are well booked at the present time. The four engines of the Air France DC-4's attract some passengers while others prefer the pressurized Ambassador as flown by BEA on the route. One Air France flight—the only first-class one—is operated with Viscounts.

Reveal Scope of Canada's Defense Effort

Extensive disclosures of the scope of Canada's three-year, $5 billion defense build-up, which started in February, 1951, have been made in a White Paper issued by the Canadian Government. Actual expenditures under the program have already exceeded the $5 billion appropriated by $137,565,000.

Highlights of the report:

• **$8.4 million was set aside** for development of the CF-105 by A. V. Roe Canada, Ltd. in conjunction with the Defense Research Board. The CF-105 is the supersonic delta-wing fighter scheduled to succeed the CF-100 Mark IV.

• **Modification** of the CF-100 fighter for use of air-to-air missiles and new heavier type guns.

• **Production** of an F-86 Sabre VI by Canadair Ltd., The Sabre VI would be powered by a higher thrust version of the Orenda engine.

• **An offer to NATO** of more than 100 F-86E's plus several hundred General Electric J47 engines and spares.

• **Current evaluation** of the USAF North American F-100 for possible production by Canadair Ltd. as a successor to the Sabre VI.

Strong U. S. Canada alliance in aircraft matters was emphasized by the summary of contracts with U. S. firms for both purchase and licensed production of aircraft including:

• **Contract** for de Havilland Aircraft of Canada to build 100 Grumman S2F subhunters.

• **Test order** for 25 Beech T-34A Mentor trainers for the RCAF by Canadian Car & Foundry's Fort William plant, which is producing T-34A's for the USAF.

• **Purchase** from the U. S. of 30 McDonnell Banshee fighters, 25 Lockheed P2V-7 Neptunes, and six Piasecki HUP twin-rotor helicopters.

• **Continued** production of the Sabre V, later phased out by the Sabre VI.

Simulator Firms Attend IATA Meeting

Seven simulator manufacturers, including four U. S. companies, were on hand for the seventh annual Technical Conference of the International Air Transport Association in Barcelona last month. Companies represented were: Engineering & Research Corp., Riverdale, Md.; Melpar, Alexandria, Va.; Link Aviation, Binghamton, N. Y.; Curtiss-Wright Corp., Carlstadt, N. J.; Redifon, Ltd., London; Air Trainers, Ltd., Aylesbury, England; and Le Materiel Telephonic of Boulogne, near Paris.

The conference also featured a closed-door session on the general subject of pilot training problems which proved to be popular with the 26 airlines represented at the meeting.

CONSTRUCTION OF THE CARAVELLE, France's SE 210 jet transport, progresses at the Toulouse-St. Martin plant of SNCASE. The plane should fly in May or June of 1955 if the twin Rolls-Royce Avon RA 26 engines are delivered on schedule.

THE BULLETIN BOARD

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Advertisers Index

American Airlines, Inc. 69

B & H Instrument Company, Inc. 28

Beech Aircraft Corporation 70

Bendix Aviation Corporation
- Bendix Products Division 71
- Pacific Division 61
- Scintilla Division 52

Bulletin Board (Classified) 66, 67

Camair—A Division of Cameron Iron Works, Inc. 11

Chance Vought Aircraft, Inc. 8

Collins Radio Company 29

Convair—A Division of General Dynamics Corporation 2

de Havilland Aircraft of Canada Limited, The 58

Esso Standard Oil Company 63

Fairchild Engine & Airplane
- Fairchild Aircraft Division 49
- Stratos Division 5

Flightex Fabrics, Inc. 58

Gilfillan Bros., Inc. 36, 37

B. F. Goodrich Company, The 12

Goodyear Tire & Rubber Company, Inc., The 3

Hardman Tool & Engineering Company 53

Hi-Shear Rivet Tool Company, The 54

Hollywood Roosevelt Hotel 42

Kollsman Instrument Corporation 46

Lear, Incorporated 50, 51

Lockheed Aircraft Corporation 32, 33, 10

Glenn L. Martin Company, The 21

Monsanto Chemical Company 64

North American Aviation, Inc. 35

Northrop Aircraft, Inc. 7

Nutt-Shel Company 6

Pacific Airmotive Corporation 41

Pan American-Grace Airways, Inc. 59

Reading Aviation Service, Inc. 48

Republic Aviation Corporation 45

Scandinavian Airlines System, Inc. 48

Scott Aviation Corporation 10

Standard Piezo Company 40

Steel Products Engineering Company, The 38

Texas Company, The 72

Trans World Airlines, Inc. 30

Twin Coach Company,
Aircraft Division 55

United Air Lines, Inc. 57

Vickers Incorporated 25

Westinghouse Electric Corporation 26, 27

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En Route

WAYNE W. PARRISH

Southward Bound. When you're driving in the United States you can pretty well estimate how much mileage you'll make in one day and not miss it by far. In Europe it's always best to play it on the conservative side and in any case you can't equal the mileages that you can click off in the U. S.

So with about 500 miles or so to go from Paris to the Spanish border at Hendaye, I figured on about a day and a half of leisurely driving. But French roads are quite good. We left Paris at 6 in the morning and I could have been at the Spanish border by nightfall had I set my goal accordingly.

Europe had a very late spring this year. Trees in Paris were out, but in the countryside down through central France, especially where the altitude was a thousand feet above sea level, there was scarcely any sign of spring at all and yet this was the first week of April.

Patisseries. One of the great delights of France is the *patisserie*, the bake shop with its vast assortment of everything from croissants fresh from the oven to brioche, eclairs, tarts, cakes, and everything else in the high-calory line.

Our first stop was for breakfast at Orleans and we found a very fine little patisserie with its customary few tables and had some croissants still warm from the oven and some drip coffee. Never go to France without dropping into a patisserie for coffee, tea or chocolate and an assortment of pastries. Out of this world, even though it's tough on the waistline.

One of the most perplexing features of France outside of the big cities is the village and small town. I've driven through many hundreds of them at all hours of the day and night and the vast majority have always seemed to be deserted. The streets or roads are usually narrow through these villages and the buildings front directly on them, sometimes with a sidewalk and sometimes not, so I suppose the people live toward the rear of the house to get away from traffic noise.

But it has been a source of constant wonderment to me how deserted the French towns seem, especially those with 2000 population and under. It is rare, rather than usual, to see anyone at all. Houses are shut up tight. In contrast the larger towns are always bustling with traffic and people walking and on bicycles and motorcycles and all the other means of locomotion.

At first I thought the deserted atmosphere in the country was due to the people working in the fields, but that isn't the whole answer, because the situation is the same day and night, Saturdays and Sundays.

Lunch at Limoges. Without any rushing, we pulled into the ancient city of Limoges, 225 miles south of Paris, by noon. I consulted my *Guide Michelin*, that absolutely indispensable traveler's companion, and chose the Taverne Lion d'Or for lunch.

It was just a typical French restaurant popular with the local people. The food was good but not exceptional, although the order of sliced tomatoes, which I get on every possible occasion, was as excellent as always. Those French can take a few tomatoes and put on the most wonderful dressing and garnishing until the dish is really worth raving about.

Limoges is an unattractive gloomy-grey industrial town of about 100,000 population, but has been world famous for its porcelains, chinaware and enamels. Unfortunately there is little of the fine old stuff left in the home town, but a new museum of porcelain has opened up which, if you happen to be a fan, is worth visiting. I sought some of the old enamel work (several fairly valuable items of which I acquired in Luxembourg several years ago) but without avail.

By this time we were down in the hilly country and I picked secondary routes to the southwest via Perigueux and wanted to avoid Bordeaux if at all possible. My penchant for cut-offs, secondary roads, and unorthodox means of reaching places cost us about an hour's time. I still think the map shows a bridge across the Garonne River a little south of Bordeaux, but I'll admit for the record that there isn't any bridge. After wandering around getting completely lost in a beautiful vineyard and farm area along the eastern shore of the river, we besought the help of a telephone repair gang.

Hopelessly Lost. It's really wonderful how people in Europe go out of their way to help out a lost traveler. Thanks to my wife's French, we explained our predicament and the telephone gang were both amazed and intrigued at how we had ever managed to get where we were and said we could never find our way out of the maze. So they got in their truck and led us about four miles through winding roads to a junction with a road which would take us south by devious routing to a bridge which actually existed. I'll say this, the countryside was delightful, but for once in my life I knew I was helplessly lost.

By this time it was dusk and there aren't many hotel towns down that way and I had a horrible thought that we might have to stop at that hotel at Villeneuve de Marsan which served me that trayful of little tiny birds with heads and feet still attached several years ago. I couldn't stomach the thought so I put my foot on the gas pedal with a determination to reach the town of Dax where there was a large hotel. We made it, by 9 p. m.

I don't like to drive after dark in Europe because of the crazy system of lights they have over there and the large numbers of people and bicyclists and ox-carts using the highway. You aren't supposed to drive with your bright lights, not even your dim ones. They use what we call parking lights most of the time and you merely flash on your brights as warning and whenever you find it necessary—which in my case is about all the time. I think European night driving is dangerous.

Overnight at Dax. Dax is a town of about 12,500 noted for its thermal and curative baths. This was still out of season but the largest hotel, the Splendid, was open. It's a big barn-like and rather depressing structure without the slightest decorative imagination. There were a few old people wandering around the cavernous public rooms. We had the dining room held open for us so we could get a quick bite to eat and then turned in. I had driven about 450 miles that day, not far by U. S. highway standards, but plenty far on the less direct route I had taken.

This being my first night on the trip, I had to decide what to do about my car. On previous trips I was driving a rented French Ford called the Vedette and usually left it on the street or in an open parking lot.

My Bentley, however, was a different matter. Not only was it something I owned myself, but it was unusual enough to attract the curious. Also we kept most of our baggage in it.

Next: Spain. So I drove the car a block away to a garage recommended by the hotel. After a lot of ringing I got the attention of the night man and drove in. My French is pretty rough, but it's amazing how much business can be transacted by sign language and a few simple words. At any rate I got over the point that I wanted the car early in the morning. Unlike the U. S., garage charges aren't high. They range from 30¢ to 60¢ a night, but few of them are up to our standards.

At Dax we were only about 55 miles from the Spanish border. I still didn't know which border crossing we would use, because I had an idea we should not go to San Sebastian but should cut over the western end of the Pyrenees and go to Pamplona, Spain, the capital of the Spanish Basque country.

Our first town after Dax was Bayonne, the center of the French Basque country, and I stopped at a Texaco station to fill up with gas and ask about the road to Pamplona.

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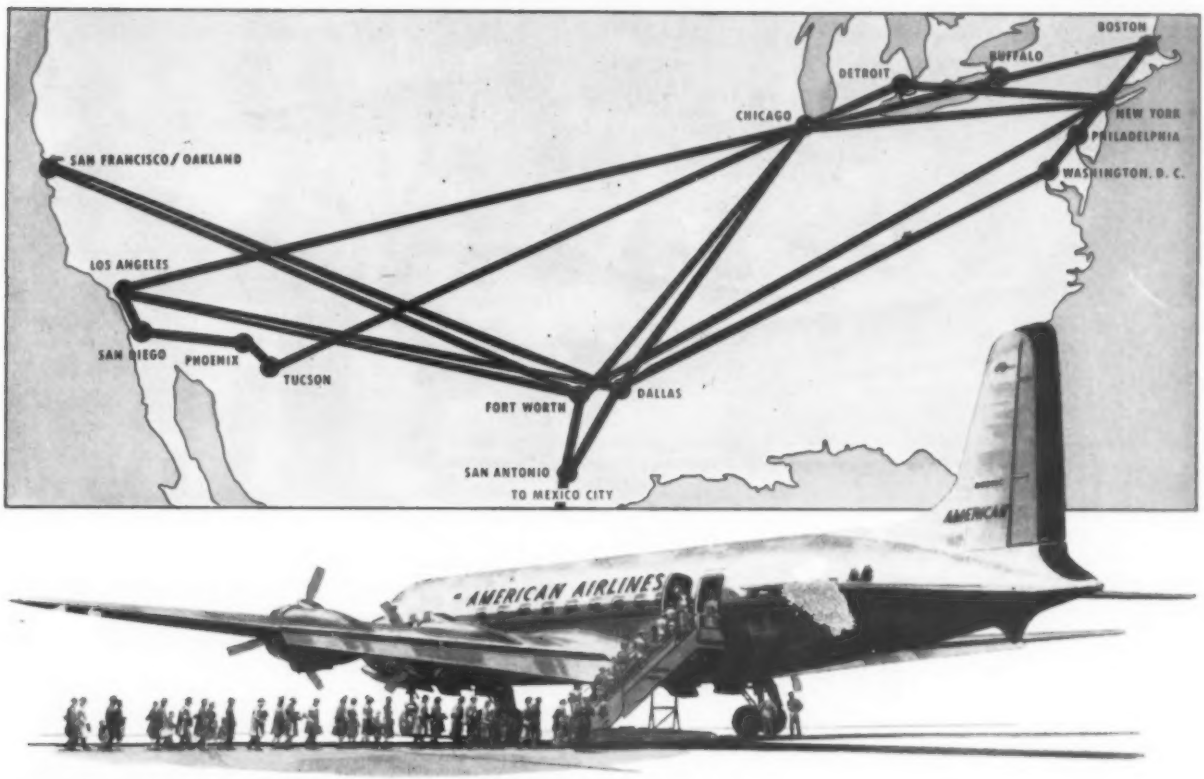

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News at Deadline

New Aero Commander Is Faster, Heavier

A completely new version of the Aero Commander, the Model 560, has been introduced by Aero Design & Engineering Company of Oklahoma City, Okla., with production deliveries scheduled in June. Price of the new plane, which succeeds the Model 520, is $69,500 fly-away-factory.

The Model 560 is distinguished by a swept vertical tail, gross weight which has been upped to 6000 pounds, and cruise speed boosted to 200 miles per hour. Contributing to the improved weight and performance are the two Lycoming GO-480-B geared engines rated as 270 horsepower each.

Other performance figures include: Top speed, at 5500 pounds gross, 209 mph; service ceiling 22,000 feet; single engine service ceiling at 6000 pounds, 8000 feet; sea level rate of climb at full gross 1400 feet per minute both engines operative or 325 fpm with one engine feathered. Power off stall speed at sea level with gear and flaps extended is 59 mph at full gross weight. A sea level, power on stall speed of 40 mph at 5500 pounds gross gives the Model 560 a 5-1 performance ratio.

USAF Supersonic Drone Decision Near

Winner of the U. S. Air Force competition for a supersonic drone is expected soon. Eight companies have submitted entries in the competition: North American Aviation, Inc., Los Angeles, Calif.; Hughes Aircraft Co., Culver City, Calif.; Goodyear Aircraft Corp., Akron, O.; Fairchild Engine & Airplane Corp., Guided Missiles Div., Wyandanch, L. I., N. Y.; Ryan Aeronautical Co.; San Diego, Calif.; Lycoming Div. of Avco Manufacturing Corp., Stratford, Conn.; Radioplane Co., a subsidiary of Northrop Aircraft, Inc., Van Nuys, Calif.; and East Coast Aeronautics, Inc., a subsidiary of Barium Steel Corp., Pelham Manor, N. Y.

Lockheed Discloses Missile Backlog, Sales

Backlog of Lockheed Aircraft Corp's newly formed Missile Div. is $3.6 million, according to a first quarter report recently mailed to stockholders. The report, based on March 31 orders, showed that first quarter sales of the Division amounted to $931,000. This represents the first time figures have been released on the Guided Missiles Div.

Commercial sales of Super Constellations during the first quarter were listed as $24.6 million or 11.4% of total sales of $215.5 million. Total company backlog was $1.3 billion, and March 31 employment at 48,346, down about 2,000 from last year.

Fitting Failure Caused Boeing Gear Collapse

Collapse of the Boeing 707 landing gear during taxi tests prior to a scheduled first flight was caused by failure of a landing gear attachment fitting overloaded by secondary loads caused by deflections, according to Maynard L. Pennel, Boeing's chief project engineer. The fitting is now being redesigned and the jet prototype is now scheduled for flight early in July.

The jet transport's acceleration during taxi tests was described as "like an F-86" by A. M. "Tex" Johnston, chief test pilot for Boeing. He also said, "Steering is good, brake effectiveness good and visibility excellent. Engine response, with the hydro-mechanical controls, is very good."

Capital Viscount Order Hinges on Certification

If the Civil Aeronautics Administration certificates the Vickers Viscount, Capital Airlines is ready to place an initial order for three of the turboprop transports, according to AMERICAN AVIATION sources in London. No comments were available at press time from Capital officials, including J. B. Franklin, vice president—operations and maintenance, who just returned from London.

Capital president J. H. Carmichael and a team of company officials from all departments are still at Vickers discussing the program.

Meanwhile AMERICAN AVIATION's London Editor reports that the outlook for Viscount certification is "good." A CAA engineering team has been in London working with Vickers and the Air Registration Board on Viscount certification problems.

The CAA team has now gone to France to discuss certification of the Hurel Dubois HD 32 and the SNCASE Carvelle twin engine jet transports and the SNCASO 1220 Djinn jet helicopter.

Brazil Buys B-17's; Ecuador Wants F-86's

Brazil, which recently bought 50 North American T-6 trainers, has now purchased seven Boeing B-17's for $824,200 under the Mutual Defense Assistance Program. The T-6 trainer purchase had amounted to $188,000. USAF officials indicate that Brazil's earlier expression of interest in the Fairchild C-82 is not likely to result in purchases because the AF cannot assure spare parts availability for this plane.

Nothing new has developed in Ecuador's plan to buy 12 North American F-86F's as a $5 million package deal. Program has been slowed down by Ecuador's need for credit arrangements while the MDAP program is now on a cash basis. Efforts are being made by the USAF, Defense Department, and State Department to ease this problem.

SAS Polar Route Approval Seen Likely

United States consent to operation of a polar route to and from Los Angeles by Scandinavian Airlines System appeared close at hand at present time. Reports indicated that SAS would get a 3-year experimental permit subject to compliance with certain capacity provisions of the Bermuda agreement. Amendment of the U. S.-Scandinavian bilateral would be necessary with a U. S. carrier to get reciprocal rights. Route would be Los Angeles-Scandinavia via Greenland and possibly Seattle, Wash.

Pentagon Discusses Jets For Spain Under MDAP

The United States will supply Spain with a substantial number of jet aircraft under the Mutual Defense Assistance Program, according to a plan now being discussed in the Pentagon for implementation by the U. S. Air Force. Republic F-84's and Lockheed T-33 trainers are the types most prominently mentioned although specific types and numbers of aircraft are classified.

Spain is already using six T-33 jet trainers and American instructors and, according to Lt. Gen. Eduardo Gonzalez Gallarza, Spain's air minister who has just completed a 25-day tour of U. S. air bases, the MDAP- arranged program is "very satisfactory so far."

CAA Reports on Traffic Control Aids

Although prototype equipment for automatic storage, switching and display of flight plan data is now installed at CAA's Indianapolis facility, the scheduled CAA/ANDB evaluation of this type unit will not get under way until April 1955. Heart of this equipment is the magnetic storage drum developed by Engineering Research Associates Div. of Remington-Rand Corp., which can store up to 2,000 flight plane messages. It can scan these stored plans in half a second and automatically transmit information on request.

Data display units, which work in conjunction with this equipment, will not be delivered by Union Switch & Signal until later this month and the automatic switching equipment being produced by Bell Laboratories is not due until January of 1955.

Saudi Arabian Buys Four Convair 340's

Four Convair 340's have been purchased by Saudi Arabian Airlines, according to J. V. Naish, executive vice president of Convair. Delivery position originally assigned to the German Lufthansa Airline have been transferred to SAA and delivery will begin this month. The order brings Convair 340 purchases to a total of 205.

Saudi Arabian Airlines is owned and operated by the government of that country under the technical management of Trans World Airlines. It is currently operating 18 twin-engines aircraft and five DC-4's.

Progress on Anti-Collision Devices Promising: CAA

Important progress on several devices to minimize the danger of mid-air collisions were disclosed to AMERICAN AVIATION by CAA's Technical Development and Evaluation Center at Indianapolis. These include work on a lightweight electronic device, of the VHF-transmitter-receiver type, by General Mills, Inc.; an infra-red light sensing type unit by Photoswitch, Inc., and periscope development by Farand Optical Co. of New York.

A CAA spokesman, T. K. Edwards, said that within a few years all airplanes will be equipped with collison warning devices for en route operation as well as periscopes for protection in the terminal area. He felt the units could be built small enough and cheap enough to be used universally.

AA Makes Top-Level Personnel Changes

American Airlines continues to revise the line-up of its top personnel with latest changes making George C. Van Nostrand vice president of properties and community relations, succeeding Walter Johnson who is now vice president and sales manager. For the past five years Van Nostrand has been vice president and general manager of American Airlines de Mexico, and will continue as general manager of AA's Mexican subsidiary.

F. J. Mullins has been appointed Van Nostrand's assistant, from his post as director of sales for American de Mexico, and will continue his headquarters in Mexico City.

William Littlewood has been elected vice president and M. G. Beard, assistant vice president, of equipment development—continuing a team which has operated through the development of the Douglas line of aircraft from DC-3 through DC-7.

Other recently elected assistant vice presidents are: Arthur D. Lewis, planning; William C. Lawrence, engineering; and John J. Casey, maintenance.

AIA Votes Down 'Farnborough' Show

Once again the Aircraft Industries Association has decided not to sponsor an air show and flying display of the type put on annually at Farnborough in Britain by the Society of British Aircraft Constructors. Instead AIA, at its annual meeting in Williamsburg, Va., voted to cooperate fully with independently sponsored National Aircraft Show scheduled for Dayton, O., over Labor Day week end. The special AIA show committee headed by Gen. Ira C. Eaker of Hughes Aircraft has been disbanded.

CAA Officials Offered USAF Jet Training

Top CAA personnel including CAA Administrator Fred B. Lee will get USAF jet flight familarization courses and general briefing in jet aircraft traffic control problems under the terms of a new Air Force proposal. USAF has agreed to give Lee and seven others a Senior Officer's Jet Instrument Flying Course including flight experience at Craig AFB, Selma, Ala. They will also provide a jet trainer simulator to CAA's Aeronautical Center in Oklahoma City to help familiarize controllers with traffic control problems.

Orders Placed for F-100's and C-130A's

North American Aviation has been awarded an $86 million Air Force contract for F-100C Super Sabres and Lockheed's Georgia Division, Marietta, Ga., has received a $57 million AF contract for 20 C-130A Turboprop transports. The figures were revealed in the Commerce Department synopsis of contract awards.

Last F-86F Rolled Out At North American

North American Aviation's F-86F production line at Los Angeles is now being reorganized for production of the supersonic F-100 Super Sabre after roll out of the last F-86F late in May. Production on the F-86D at Los Angeles and F-86H at Columbus continues. The F-86F production schedule was completed on the original USAF schedule despite time lost during last year's strike.

NWA Sees Subsidy-Free Pacific Operations

An offer by Northwest Airlines to fly the Seattle-Honolulu route on an exclusive basis without subsidy capped three days of oral argument before CAB on the matter of Pacific area services. NWA counsel C. Edward Leasure made the offer in the face of CAB examiner Thomas L. Wrenn's recommendation to withdraw NWA from the route in favor of an exclusive franchise for Pan American.

Major certificates in the Pacific area are up for renewal or carrier-suggested amendments. Leasure claimed PAA seeks to get "complete control" of trans-Pacific business charging that "the U. S. has been at the mercy of Pan American for years."

PAA's Henry J. Friendly, however, asked CAB to remove the 1,060-mile "detour" on its service between the U. S. and Japan by permitting operations over the North Pacific route now operated exclusively by NWA. PAA now must go via Hawaii. TWA's Gerald P. Brophy said the U. S. would "lose face" in the Far East if it fails to renew TWA's Far East segment and to grant its proposed India-Japan extension.

Meanwhile, Richard R. Pettit, pushed Transocean Air Lines' bid for a "regular or irregular" certificate in the Pacific under which it proposes non-subsidized passenger and cargo operations.

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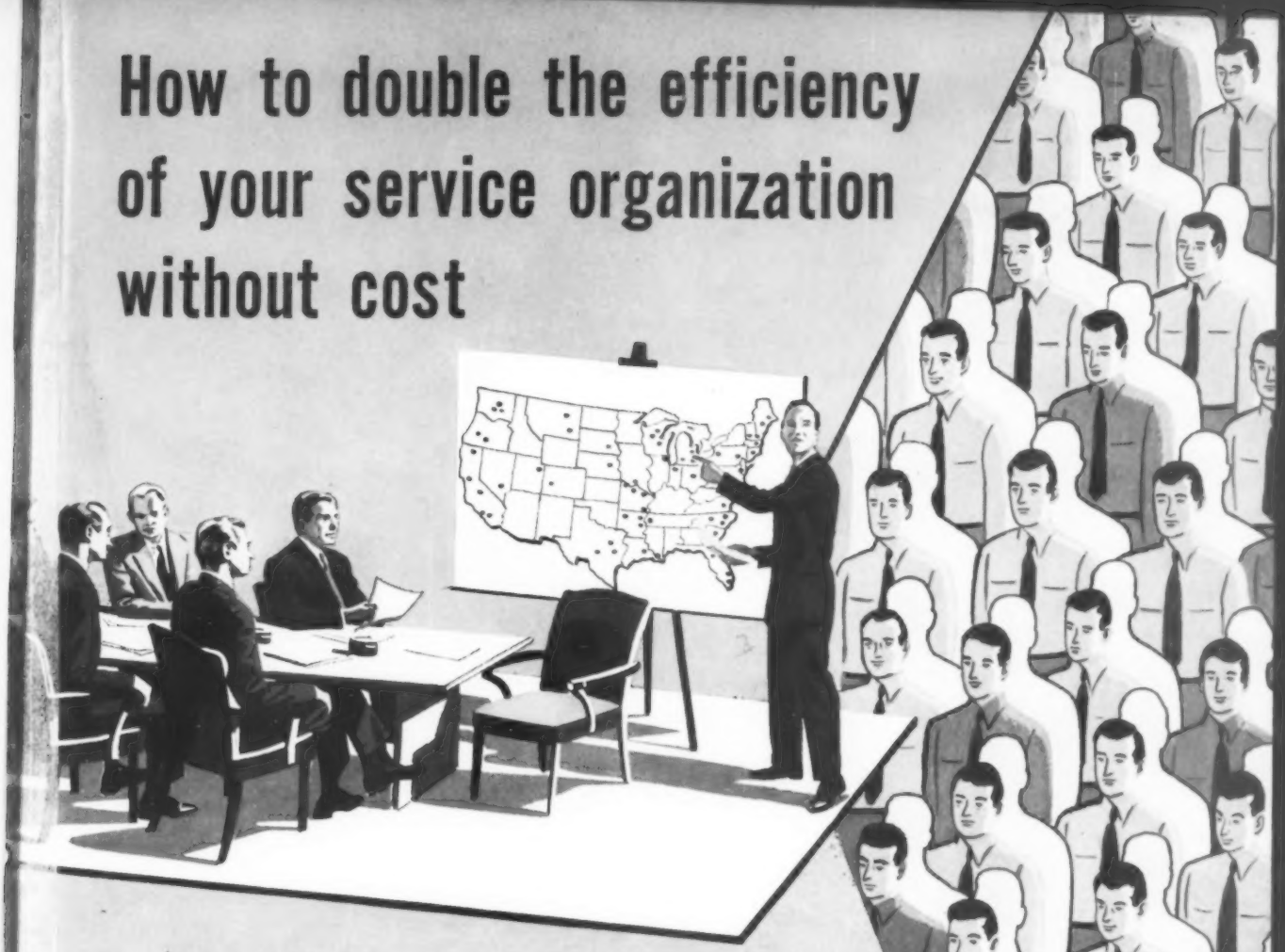

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